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PSYCHIC
AND
ECONOMIC RESULTS
OF
MAN'S PHYSICAL
UPRIGHTNESS

Published by the Author
849 Lincoln Avenue
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PSYCHIC AND ECONOMIC RESULTS OF MAN'S PHYSICAL UPRIGHTNESS

"There can be no alleviation for the sufferings of mankind except in absolute veracity of thought and action and in a resolute facing of the world as it is, with all garment of make-believe thrown off."—
THOS. H. HUXLEY.

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PREFACE.

The title correctly indicates the contents of these essays, in which the origin of some of the more important mental, moral, social, economic and political conditions of today has been traced to the physical peculiarities of our brute ancestors.

Nothing except what competent scientists regard as settled has been taken for granted, but generally speaking it has been demonstrated, that from these peculiarities, such conditions had to follow as inevitable results.

In chapters one to eight, inclusive, our brute ancestors are considered as they were in the period before they had learned to use sticks and stones. In chapter nine this limitation has been disregarded.

Dealing with problems so closely related to the fates of vast numbers of people alive today our judgments tend to be colored by our sympathies. Foreseeing this danger, the author has carefully guarded against it by aiming at a cold, judicial attitude of mind, to which human beings are no more than numerals in a calculation, or lines and angles in a geometrical figure.

The aim has been to make the argument conclusive in the eight earlier chapters, suggestive in the ninth.

T. W. HEINEMAN.

Pasadena, Cal., 1906.

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1906.

PART I.

NATURAL SELECTION OF HUMAN INTELLIGENCE.

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CHAPTER I.

BRUTE-MAN'S PHYSICAL DISABILITIES AND PERILS.

With wider recognition of the influence of heredity on character and destiny, the interest in the genealogy of the human race naturally increases. Darwin's "Descent of Man" indicated clearly enough the direction in which to look for our ancestors, but knowledge of facts bearing upon the subject was, in his day, still too fragmentary for the general acceptance of his theory. Since then, several of the missing links in the chain have been supplied and the discovery of Eugene Dubois has been especially significant.

For the thigh-bone, teeth and part of a skull, which he found in an ancient dry river bed of the Island of Java, were more like the corresponding parts in the human skeleton than any other bones or parts of bones obtainable from the quadrumana. Obviously these remains belonged to an extinct species intermediate between man and the most man-like anthropoid apes of today. *Pithecanthropus* is the name given to this extinct species, and some naturalists have gone so far as to assume that this discovery has supplied the last of the missing links, in the chain of descent from gibbon to man.

But no assumption of this or any other kind, with reference to the descent of man, is needed, as a foundation or otherwise, to sustain the coherent syllogisms presented in the following chapters, which are based on the proposition: "that all higher types of life have been derived, or are de-

scended, from lower, and that man's origin is no exception from this *unalterable* rule."

For evidences and arguments sustaining this law converge from every branch of the natural sciences, and from all the widely divergent fields of inquiry in which naturalists and investigators have been engaged, and although these evidences and arguments have been frequently contested and with great ability, they have always been vindicated in the end.

Hundreds of institutions of learning, experts by the tens of thousands, competent observers and thinkers, authors by the hundreds of thousands, have contributed corroborative facts and conclusive lines of reasoning. Tests and tests of tests, series after series, practically innumerable, have been applied, until finally the consensus of *the competent* has become unanimous.

Does this assert the evolution of man from lower forms of life? It does assert his descent, or derivation, but not his evolution. To assert the evolution of any organic type from another, is a misuse of language, apt to lead to misapprehension.

The term evolution is properly applied only to that process by which inorganic and organic masses or individuals progress, by dissipation of motion and concentration of matter, from more or less indefinite incoherent homogeneity, towards more definite coherent heterogeneity, which, among organic forms of life, implies a greater degree of specialization and adaptability. Such a process in sexually reproducing organisms obviously cannot be continuous from generation to generation. For a new individual of a new generation springs from the conjugation of the sperm cell of one organism with the germ cell or ovum of another. This conjugation is *the beginning* of the evolution of a new organism, and not a

continuation of the evolution of either or both of the organisms from which these two different cells have come. Thus higher forms of life are not evolved, but derived, descended from lower, by variation, through sexual reproduction.

Limiting consideration in this place to the more important among his external physical traits, man is distinguished from the quadrumana mainly by:

1. Arms proportionally shorter;
2. Finger tips, fingers, and thumbs, in the upper extremities, mainly specialized to sensations of touch—as distinguished from the corresponding organs of the quadrumana, which are almost exclusively adapted to prehension and locomotion;
3. At the lower extremities, feet distinguished from hands, by having the hallux unopposable, because of the shape of the entocuneiform bone, and long enough to serve as a fulcrum, standing or walking, which, in connection with the position of the occipital foramen magnum, just back of the centre of the base of the skull, and the double curvature of the spinal column, is the essential condition on which physical uprightness depends;¹
4. Proportionally larger and more muscular lower or posterior limbs;
5. A body more slender in proportion, with smaller

1. Most scientists continue to call the posterior extremities of apes, including those of the troglodites, hands, and all apes quadrumana. This view has been adhered to in these essays.

There is, however, good anatomical reason for classifying these extremities, with Huxley, as feet. But since functionally they are hands, almost to the same extent as the anterior pair; and since the troglodites, according to some observers, usually walk on the knuckles of these members, and according to others, on the inside edges, it seems more rational to retain the former classification in these essays, at least.

thoracic cavity, therefore, necessarily less capacious viscera and vitals;

6. A larger cranium, therefore, more room for brains;

7. Ear lobes and chin;

8. Glossy bare epidermis covering almost the entire body, in lieu of the hairy hide of the quadrumana and quardrupeda.

It has been asserted with great confidence that at one time all men had hairy bodies; that the wearing of artificial coverings, first skins and then clothes, made hair unnecessary and interfered with its healthy growth; and that, therefore, men now have smooth skin, without hair. It is asserted that the exceedingly rare appearance of men with hairy bodies, and the prevalent hairiness of the Ainos of Japan, is proof that at one time the bodies of all men were hairy. There is *not a particle of evidence* that hairiness ever was general among men. The exceedingly rare appearance of a hairy man and the exceptional existence of one hairy nation is no evidence; nor is the existence of fine, almost invisible hair all over the body; nor is the hairiness of the six months old human embryo. These facts can only be considered as evidence that by variation the "genus homo" has descended from hairy *non-human* brutes.

Nor is it reasonable to suppose that the wearing of artificial covering has caused a hairy ancestry to bring forth a hairless progeny, for this is taking the transmission of acquired traits for granted.

Hairy coats collect and harbor fleas, lice, and similar insect pests on the bodies of animals, and also disease germs, and here these multiply prodigiously. The secretions of the skin furnish ideal culture media for these germs, and the crawling and hopping insects carry them around. Thus it requires but a slight accidental scratch or cut to cause the

germs to invade the bodies of their hosts and to spread devastating epidemics in herds or entire races.

Hairlessness, which under natural conditions is such an inestimable adjunct to cleanliness, is, therefore, *caeteris paribus*, of great survival value and this fact makes it very probable, *if not certain*, that this trait was naturally selected in the human race. At least it produces such a strong preliminary case in favor of this conclusion, as to throw upon those who deny it, the onus of proving the contrary.

It is otherwise with the quadrumana, when in their natural habitats. Woodticks, jiggers and the other insect pests found on the trunks and branches of forest trees and shrubs, cannot live and propagate in hair or fur. The insects and disease germs, which are dangerous to brute life, are plentiful in moist and wet regions on the ground, but *not* on the trunks or branches of trees. Hairlessness, therefore, has no survival value for apes.

It is, however, quite rational to believe that the wearing of artificial covering would make hairy men lose their hair, but the offspring of such would not, therefore, be born less hairy than their parents. Again, if men were formerly hairy and had only become hairless by the wearing of artificial covering, then those tribes and nations which have never worn artificial covering would still be hairy. But some of the savages of Africa and Australia, and some of the natives of India, have gone naked since time immemorial, and still do so ~~up to date~~; yet they are as free from hair as the people of Europe. Finally, why in common sense should creatures covered with fur or hair be supposed to wear artificial covering?

Distinguished by the eight differences above noted from the genera, most nearly related, the "genus homo," as a new type of life, had to share in the struggle for existence, bat-

ting with the unthinking, unfeeling forces of nature, and with great numbers and varieties of creatures fiercer and more powerful than he, which, in addition, were naturally armed and provided with means for protection, escape and rapid multiplication. Was he well fitted for the trial? Few if any brutes, were less so.

The adaptations by which animals when not otherwise disadvantaged *survive* in the struggle for existence may be broadly classified under these four heads: 1st—Means of offense and defense; 2nd—Means of protection; 3rd—Means of escape; 4th—Means of multiplication. Under all these heads, hardly a creature among the higher mammalia, birds, fishes, reptiles, and insects, would *rank as low*, for natural endowment, as man's brute ancestors did before they had learned the use of sticks and stones.

Considering the four classes of adaptations, in the order above stated, we find that:

Firstly, most creatures are naturally armed for offense and defense. They have horns, tusks, claws, stings, fangs, talons, poisons, sharp teeth, protruding jaws, etc., where-with either to defend themselves against enemies, or to attack and pursue their prey. Man has none of these.

Secondly, most creatures possess heavy fur, thick hides, or both, or some equivalent of these, which protect their bodies from scratches, cuts or abrasions, which thorns, needles, stones, etc., or antagonists in the original habitats, might otherwise inflict. These means also protect them against changes of temperature, and from biting winds and biting enemies; from snow, hail, rain, etc. Man has no protection of this sort.

Thirdly, the hairy bodies of many creatures match well with the prevailing tints in their usual habitats, and are, therefore, ready means of concealment from their enemies

or prey. This increases their chances of escape and for obtaining sustenance. Primitive man's hairless, glossy, unclad, bare skinned, tall, upright body, made him a particularly prominent, easily perceived mark. The absence of hide and fur, which carnivora are forced to strip off before they can devour other creatures, made primitive man an easy, therefore, attractive morsel for these predatory creatures.

Proportionally to the size of his body, the viscera of man are less capacious than those of most other mammals. He is, therefore, forced to take food oftener and cannot uninterruptedly sustain efforts for as long a period as his enemies or competitors. This is an enormous disadvantage in the struggle for existence.

Fourthly, in the matter of multiplication, nature has excessively discriminated against man, for the period of pregnancy in our race is exceptionally long, and the number of offspring born at one birth is as low in our case as in any.

Besides the above mentioned deficiencies in natural endowment, man is afflicted with numerous *special infirmities*, among which may be noticed the absence of valves from the venæ-cavæ and from the iliac, hæmorrhoidal and portal veins. Quadrupeds have no need of these valves in these blood vessels, but the lack of them in man produces frequent cases of congestion, strangulation, illness and death. Many human beings are incapacitated annually, or lose health and even life, by femoral and inguinal hernias, brought on and aggravated by the upright attitude. The frontal exposure of man's femoral artery, brought on by uprightness, annually demands many victims, even in these days of medical and surgical skill. In the primary ages of brute-man's existence, the sacrifice of life from these causes must have been enormous.

The disadvantages above recited react with like severity upon all specimens of the race, irrespective of sex or age. Others must now be explained which are more dangerous to survival than these, although they directly affect pregnant women only.

The females of quadrupeds may, during pregnancy, carry a numerous litter of young in their bodies, and yet without experiencing an appreciable degree of increase in effort, or in inconvenience: they can run away from pursuing enemies, make chase to capture prey, or collect sustenance. For the foetal burden is near the ground, horizontally distributed over the entire length of the abdominal muscles. These in turn are supported from above by the full strength of the vertebral column, to which, on the principle of the arch or truss in architecture, the abdominal muscles are attached by intermediate tissues. Even if a quadruped stumbles or falls, its under side is so close to the ground that the risk of injury is comparatively small.

It is very different with the pregnant female of the human race. The erect attitude concentrates the pressure of the foetus, supporting tissues, and enlarged uterus, at the lower forward end of the abdomen, making the bearing of offspring an *exceptionally incapacitating strain upon almost every movement*, thus increasing the risks of being overtaken by enemies, starving from inability to capture prey or gather sustenance, and of injury or death in consequence of falls or even stumbles.

In quadrupeds the anterior, posterior, lateral, peritoneal and round ligaments firmly support the uterus and prevent it from pitching too far forward towards the diaphragm, but the upright attitude interferes with their doing this service, in the case of human females, which accounts for the frequency in our race, of painful and dangerous illness

from prolapsus uteri. The same position and shape of the pelvic bones, which makes parturition easy and painless in quadrupeds, becomes in the human race the prolific cause of suffering and death to mothers and offspring. With so many odds against it, how did the human race escape extinction? It will be the purpose of several subsequent chapters to find a rational and sufficient answer to this question.

CHAPTER II.

THE MEANS OF ESCAPE.

The announcement made in the preface, that all but the last chapter in these essays should be devoted to the conditions of brute-man, before he became familiar with the use of sticks and stones, indicates where this inquiry should end, but leaves the period uncertain in which it should begin. This, however, is suggested by the use of the terms, brute-man, two-footed upright brute, etc.

For, when our ancestors had so far differentiated from the genera most closely related to them that they could no longer be classified with them, but were a species by themselves, were brute-men, then they became subjects for the line of investigation followed in these essays.

When a creature supplied at the posterior extremities with two feet, distinguished from hands by the modified form of the entocuneiform bone and by having the hallux as a fulcrum, and at the anterior with two hands and with the occipital foramen magnum a little back of the centre of the base of the skull; that is to say, when a brute, which although closely related to the quadrumana, was yet not fitted for tree life or climbing, but adapted instead to upright walking or standing, made its first appearance on earth, then was the beginning of the human race and of the period to which these pages are devoted.

In the last chapter attention was directed to a few of the many disabilities and perils with which the human race

was loaded down, when it made its first entry in the struggle for existence.

Any one of these is ordinarily sufficient to doom a type of life to rapid extermination. When two or more of them apply to the same variety, speedy extinction is certain, unless their effects are counter-balanced by a rapid and copious rate of multiplication.

The "genus homo," however, was afflicted with all these disabilities, perils and infirmities, and with still others to be mentioned hereafter, while at the same time the rate of multiplication in our race, is almost the slowest known and the farthest removed from copiousness, if the elephant, eagle and a few other instances are excluded; and it is noteworthy, that these exceptions, although supplied with natural means of offense, defense, protection and escape, exist only in scanty numbers, not very far removed from extinction.

Humanity's survival, therefore, falls little short of being miraculous, and can only be accounted for by the high average of intellectuality attained. Until a degree of this had been reached and applied to the use of sticks and stones, if our race was to survive at all (and it has), it must unavoidably have remained *in the interval*, in such close proximity to extinction as to be continuously on the verge of it, escaping only by a very narrow margin.

As an objection to the above it may be assumed, however, that a superior type of intelligence already distinguished the very first specimens of man's upright brute-ancestors, and that these began immediately to use sticks and stones, and that, therefore, the interval above mentioned may never have existed.

To many people a literal interpretation of the bible story of Eve, the serpent, and the tree of knowledge, still seems sufficient authority for the first part of this assumption. As

a poetic allegory it is a work of unique charm. But anything so absolutely contrary to the whole trend of experience cannot be made acceptable to impartial, rational minds, by even the most charming of poetic allegories. It is irrational to assert the extraordinary without evidence, and there is not a particle of evidence to support either the story or the assumption. It is furthermore a settled principle ^{among higher} that new types or new traits do not come into existence suddenly. Whenever investigated, it has always been successfully demonstrated that they start from small beginnings which primarily emerge, through variation, by sexual reproduction. Then if they have survival value, natural selection keeps on accumulating them from generation to generation until they become prominent, typical.¹

Intelligence was the last achievement of life, the function of a structure vastly more complex and unstable than any that had existed before. To assume that a superior type of this faculty should have appeared on the scene full-fledged, is not science, nor reason; it is superstition. It is to assert a monstrous nullification of the order of nature.

Referring to the second part of the assumption; it can not be denied, that a two-footed upright brute is organically better fitted for the clever use of clubs and missiles than the quadrumana are, and if creatures so fitted understand the use of these appliances, then they are well prepared for the struggle for existence, though otherwise sadly disadvantaged.

1. Thinking of higher animals only, the possibility was overlooked that the text might be construed into a sweeping assertion of the applicability to all forms of life, of the principle enunciated above. The insertion of the words, "among higher animals," limits the language as required by the present state of knowledge.

On comparing higher animals with plants, the comparatively low degree of organization of the latter, in which distinctive individuation can hardly be said to have begun, their frequent propagation by budding, grafting, slipping and, more yet, the fact that in most plants the reproductive organs are mere special adaptations of the structures otherwise devoted to nutrition, lead the mind, in their case, to expect sudden mutations of type or trait from changes in nutrition, etc. But in higher animals the reproductive organs are so highly differentiated from all other structures of the body—to such an extent segregated and isolated from the functions and activities appertaining to the individual, as distinguished from race life, that August Weissman, and other distinguished scientists, have pointed out that it is *utterly inconceivable* that the reproductive substance could be significantly modified by any of the ordinary influences of the environment during the life time of an individual.

Darwin himself was so impressed with this that he professed hesitation and but small confidence in his own theory of Pangenesis; considered it as a temporary expedient only.

Brutes quickly learn the advantage of those means of offense and defense which nature has supplied to their *bodies*. But to teach them the use of artificial appliances requires either a developed hereditary instinct, or long training joined to a high degree of intelligence. Could the two-footed upright brute from the beginning have reasoned out the advantages of sticks and missiles and the manner of handling them?

This is the first part of the assumption over again, for it presupposes a degree of intelligence utterly unthinkable in the case of these primitive brutes. Only by being repeatedly put through the several steps in the process, can brutes be taught new tricks or habits. Civilized man teaches children and ignorant adults. But wild brutes have, with a few exceptions, such as when parent birds teach their young how to fly, only nature for a teacher. And how could nature teach a brute to go through the motions of breaking off a branch, trimming branchlets off for a stick, then grasping and uplifting it and striking blows, not at random, but carefully aimed, at a definite object, with premeditated purpose? Then to realize in mind what it had accomplished, and by what means, and to retain the remembrance of it, as an inducement to repeat these actions voluntarily in future, is unthinkable in the case of the stolid, primitive, two-footed brute.

The unimpressionable stolidity of savages, even, is a well-known fact, and it has been demonstrated that, on the average, this stolidity differs directly as the time distance from civilization. How dense then must have been the dullness of our brute ancestors!

Nature teaches by frequent repetitions of incidents (so-called accidents) which *directly induce*, step by step, the various consecutive, coherent motions or actions which, when

compounded in a certain order with duly adjusted emphasis, constitute a habit or habitual mode of action. Any person who imagines that a complex and lengthy series of accidents, such as would be competent to induce a stolid brute to go through the motions and mental changes recited in the last paragraph but one, could be repeated in the same order, and with like emphasis, so frequently in the experience of that brute as to teach him the habit of making those motions deliberately, *recklessly abuses the representative faculty*.

It is very different, however, with an instinct; for this originates by variation, through heredity and selection. In sexually reproducing organisms variation is the cause of an infinite variety of living forms and of the structural arrangements within their bodies. No specimen among these organisms and structural arrangements is in *every* particular *exactly* like any other. The vast majority of them is either not at all, or at best but poorly, adapted to their environment conditions. At rare intervals specimens occur which are specially and wonderfully adapted. This applies to races, individuals, organs, tissues and structural arrangements. It applies to the nervous system and to nerve substance and to structural arrangements of nerves.

Among the rarely occurring structural arrangements of nerves there have happened some which are capable of initiating motions, which, under suitable conditions, favor the reproduction and survival of the type of organisms possessing these structures and performing these motions. Such nerve structures are the causes of so-called instinctive actions, which, being selected, are then transmitted as race instincts.

The wonderful instinct of a certain wasp, which stings a particular kind of caterpillar in nine definite places, just where the nine principal ganglia of the creature are situated, and then deposits its eggs in the body of the animal, is of

this sort. The stinging of the nine ganglia completely paralyzes the caterpillar, but does not kill it. The grubs, developing from the eggs deposited in the body, feed on the living flesh of their host and are thus enabled to survive. These caterpillars live in hot countries. If, instead of being paralyzed, they were stung dead, then their flesh would rapidly putrefy and the young wasp grubs, instead of being nourished by wholesome food, would be poisoned. That kind of wasp would become extinct.

Undoubtedly myriads of varieties of wasps died out because they did not sting in the exact places where the nine ganglia are located. At last one kind was born with nerve structures so precisely adjusted that the nine stings were performed in the exact localities where the nine ganglia are situated. That kind of wasp has survived. Thus nature works out these wonders in *infinite* time, with *infinite* variety, through *infinite* waste, by natural selection.

Can reason supply any explanation of so wonderful an instinct? Indeed the explanation seems obvious. There must exist a natural attractive affinity (chemical or otherwise) between the substance in the wasp's sting and the substance in the caterpillar's ganglia. This affinity, ordinarily inactive or only potential, becomes active when stimulated by the wasp's catching sight of that kind of caterpillar.

But the teaching of a habit to a creature, by many repetitions of a series of accidents, is a very different matter. This has neither infinite time to work in nor infinite variety to work with, but is limited in its educational possibilities: to the lifetime of the creature it works on; to the narrow capacity of that brute's intelligence; to the vicissitudes of its stolidity and inattention, and to the *infinitely great improbability* of a series of natural accidental inducements being frequently repeated exactly alike in quality and

in the order of their occurrence, under similarly adjusted environing circumstances.

But one of these two-footed upright brutes, in an effort at climbing, might grab a branch for support, and then this branch might accidentally break off and remain in the brute's hand. Would not that teach him the use of a stick? By no means! To begin with, there are many times many chances that the branch would not be suitable for a stick, on account of branchlets. Then what should make the brute retain it in his hand? Not any intellectual expectation of making use of it. That is inconceivable in advance of experience, and to assume antecedent experience is to beg the question. And since all wild creatures avoid avoidable efforts, it is more than likely that brute-man would drop the stick immediately upon becoming aware that he had missed his hold. Furthermore, on the branch breaking, the recoil would startle the brute and perhaps make him angry or afraid, and all the more likely to drop the stick. To teach him the use of a stick, it would have to be further assumed, that, immediately after grabbing it and after the recoil from breaking, another accident made him accidentally lift the arm and then strike a blow. Then, by further accidental coincidence, the blow would have to fall just in the right place, on some creature or object happening to be there, at the exactly right moment, and that this combination of exact accidents achieved so impressive a result in the life of the creature as to determine his stolid nature to remember and voluntarily repeat these actions on future occasions. He would have to say to himself: "This is a stick. Sticks come from trees, when you want to climb and happen to miss. Sticks must first be lifted and then brought down violently. That kills some animal good to eat, or one that might have killed and eaten me, unless I had first struck it with the stick."

Then this complex series of coincident and precisely adjusted accidents must be repeated frequently before a single man-brute could acquire the habit.

Even so comparatively simple an accident as that a grabbed branch, fit for a stick, should break off and remain in the hand, not to mention the subsequent series of necessary accidents, must have remained of *exceedingly rare occurrence* in the life of any one of our two-footed ancestors. For they were *not fitted for tree life*. Their two feet made them unfit for it. Their proper habitat was the solid earth. On this their conditions were sufficiently against them, but up in the branches of trees, apes, serpents and felines had them at much greater disadvantage.

The assumption that brute-man used sticks as weapons, before his intelligence had made considerable advance, is for these reasons untenable.

Passing from sticks to stones, it seems even more improbable that the two-footed brute should have learned the use of missiles from the frequent repetitions of accidents competent to induce the motions involved in the seizing and throwing of stones at a mark.

For, while standing or moving, the hands of the two-footed upright creature dangle from eighteen to thirty inches above ground, and at that elevation *can never come accidentally* in contact with stones. When in a sitting or horizontal attitude, the accidental contact with stones is more probable; but what accident should induce a brute to lift, swing, and throw a stone at a definite mark, with a definite purpose, *in advance of experience*? While the contact might be accidental, it is utterly unthinkable, that from a sitting or prostrate position, the lifting, swinging, throwing, etc., could be so. It must, if occurring at all, in those positions always be *on purpose*. And purpose presupposes antecedent expe-

rience, which is begging the question. This applies equally to sticks and stones.

The same line of reasoning applies here, a fortiori, which was followed in detail in the matter of sticks, and it leads to the same conclusion, viz., that such an assumption is untenable.

And yet it is a well-known fact that apes use sticks and missiles. Their *natural relation* to these appliances, however, accounts for this fact, in a way which is *not* applicable to the man-brute. For whether resting or moving in his natural habitat, among the aboriginal forests, an ape is distinguished from the two-footed upright brute by generally having one or more of his hands grasping the branches of trees. From the weight of his body or the muscular pressure of his hands, it must frequently happen, that one of these branches breaks and remains in a hand. Nor would he then be as liable to receive the recoil and consequent perturbation as the man-brute. For he supports himself by holding on with several hands to various parts of a tree. With the frequent natural repetitions of such incidents, it seems not at all improbable that an occasional coincidence might induce the lifting of a stick and striking of an accidental blow. Therefore, would the two-footed brute *not*, but the ape might, be taught the use of sticks, *in the natural course of events*.

As to missiles, it should be further observed, that apes are almost continually among the branches of trees, where fruits and nuts grow and where dead branches occur, and that, therefore, it cannot be a rare experience for these creatures to observe a fruit, nut or dead branch break off and fall to the ground. Occasionally a fruit or nut, singled out or seized by one, may drop; or a branch which is held may break. Then, if the falling object happens to strike a creature below, that is a lesson in the effect produced by

missiles. Actions done ordinarily for a purpose are sometimes playfully repeated without a purpose. So fruits and nuts may be plucked playfully and with no purpose of eating them, and then dropped. This might teach how use can be made of fruits and nuts for missiles. Sometimes a fruit or nut after being plucked, may prove unsatisfactory, and then the ape may throw it away in anger. Whether the thing so thrown away strikes another creature or not, it is very likely to teach a lesson in the effect of missiles. It follows, therefore, that accidents and incidents *of frequent occurrence, in the natural course of events in an ape's life*, are particularly favorable to making these creatures familiar with the nature and uses of clubs and missiles, but *the very opposite* is true with reference to the two-footed upright ancestors of man.

It is all the more wonderful, and calls for explanation, that apes handle these artificial tools and weapons so rarely and so clumsily, while evidence is not lacking that primitive man in the paleolithic period already used them universally and skillfully. In their natural habitats, up among the branches of the forest trees, apes, by the possession of four hands, to which, in the case of a large division, a prehensile tail is added, are the supreme masters of the situation and have no need of arming themselves artificially. Even if they happen to be on the ground and there meet with a creature they wish to capture, or one they are afraid of, it is ordinarily far more easy for them, and far more promising of success, to swing themselves up among their native branches and do battle from above; and travellers tell of Orangs and Gorillas which, from a low hanging branch on which they rest, watch for creatures that pass underneath. Then they reach out, grab the passer around the

throat and lift him from the ground until he dies from suffocation.

The occasions are very rare when sticks or missiles are of any real use to apes. Neither have they the intelligence to suspect the multiform potential applicability of those articles. Besides, they are not organically fitted to make skillful use of them. The difference between their bodies and that of the two-footed upright brute is sufficient to make them rather clumsy and inaccurate in handling them. Such habits have no survival value for them.

For these reasons, though they had learned their applicability long before the upright brutes, yet they have never become articles of common use among them, nor have they ever improved themselves in the manner of handling them.

How were the upright brutes taught to avail themselves of these arms and tools? It seems probable that they learned their application from observing the clumsy and rare use made of them by their ape relatives. Since it has been proven that these habits could positively never have been acquired by the occurrence of accidents or incidents in the natural course of events, they must have been learned by some indirect method. No *other* indirect method is so simple, so natural, so suggested by the facts known in this case. Therefore, on the rule of parsimony, this explanation should not be rejected until a better one has been found.

This leads to a discussion of the nature of the imitative faculty. This inheres in the nervous system, and directly differs in degree as the sensitiveness of its owner. It tends to reproduce in him motions which he has observed in other creatures, and does this because the perception of these motions in another excites the corresponding nerve tracts in the perceiving individual. Sympathy differs from this faculty only in this, that it reproduces feelings, emotions and

thoughts perceived in another. But since apes live in trees and the man-brute on the ground; since the former are well fitted by nature for the struggle for existence and the latter are not; the opportunities must have been few and rare when our brute ancestors could observe these habits, so as to be induced to imitate them. Neither would our brute ancestors be likely to perceive how these habits could be made useful, seeing that apes handle sticks and missiles clumsily. Only after many generations, when a higher order of intelligence enabled our ancestors to reason from the clumsy movements of apes to the great possibilities of the skillful use of clubs and missiles does it seem probable that the brightest of them may have experimented how to handle them.²

2. Sir John Lubbock in "The Origin of Civilization, etc.," tells of monkeys which use stones to crack nuts, of one who used a stick to open a lid of a box, and that the house of the Chimpanzee is equal to some of the rude habitations of savages.

Margaret Selenka, who with her husband, Emil, spent considerable time in the aboriginal forests of the Sunda Islands, for the purpose of observing the habits of the Anthropoids, reports a most interesting incident. They had for a long time made unsuccessful attempts to capture a living specimen of the Gibbons. Suddenly, one day, when in the forest, she touched his arm and pointed to a female with her baby crouching on one of the upper branches of a tall tree. Quickly he aimed his rifle and fired, and the wounded female still holding her baby dropped to the ground near the trunk of the tree. Immediately thereafter they perceived a large crowd of male and female Gibbons of various ages scamper away from that part of the forest and disappear. Then they set to work to capture the wounded female, who fought furiously, and while they were thus occupied their attention was attracted by a noise much like the approach of a crowd of people, and on looking in the direction, perceived a troop of about fifteen tall, full-grown Gibbons, all males, making directly toward them with gestures of fierce anger. The rifle being unloaded, they had no desire to encounter these angry brutes and fled precipitously, observing from the distance that the troop proceeded no further than the wounded female and her young, which they lifted up tenderly and carried away. Evidently these males had simply taken their females and young to a place of safety and then returned to rescue their wounded.

The same travelers report that it is an inspiring sensation to hear the sound of the long-drawn-out musical laughter with which

Hundreds or thousands of generations must have passed before that status was reached!

This impartial discussion of the assumption, stated on page 17, shows the same to be *without foundation in either fact or reason, and utterly untenable.*

We may, therefore, with increased confidence, resume the argument where we left it.

The possession of superior intelligence would, in the struggle for existence, surely prove to be of incalculably great advantage to any kind of creature, and since all other types of life now existing, excepting ours, have survived without it, *it is certain* that special causes, prevailing exclusively in our race, must have been at work to produce the marvelous phenomenon of human intelligence.³

the gibbons salute the dawn of daylight; that it entirely relieves the sense of extreme isolation, which human beings are apt to feel when sojourning during lengthy periods in the depth of the aboriginal forest.

3. If it be contended that there exists an inter-dependence between two feet, hands and the other structures on which the upright attitude depends, on the one side, and the possession of a high degree of intelligence, on the other, then the reply is, firstly: That this phase of the argument will be part of the subject matter of the next chapter; secondly, That there cannot be any direct dependence one on the other, but only an interdependence between intelligence and the elevation above ground of the organs of sight, hearing, smell and touch, and that the extent of this elevation is dependent on the upright attitude.

The scope of these sense organs, except touch, for mathematical reasons increases as the squares of their elevations above the ground. But since the impediments to the passage of light and sound increase very rapidly, the nearer the surface of the ground is approached, therefore, the real ratio of increase is much greater than the ratio above stated and probably at least equal to the cube of the altitude.

No observer of four-footed animals can have failed to notice that the mentally energetic and intellectually superior among them make frequent efforts to elevate their heads for the purpose of hearing and seeing, more especially, when their curiosity or apprehension is aroused, having learned, by experience no doubt, the advantage of this mode of conduct.

The extent of the survival value, of any new trait or faculty appearing in a race, depends on these three factors: 1st. The urgency of the need for it. 2nd. The range of its applicability. 3rd. The existence of incentives to its use. Need is not a direct incentive to use, for it takes experience and intelligence to perceive and remember the relation existing between the need for something and the activity of the faculty competent to supply the need.

Surely the disabilities, infirmities and perils of primitive man sufficiently established the *urgency* of the *need* of *any* faculty which had survival value; and no other faculty is of such universal, infinite applicability in adjusting a creature to its environment as intelligence. Therefore, to show the overwhelming survival value of intelligence in the case of the primitive brute ancestry of the human race, it only remains necessary to ascertain whether or not, during the long interval referred to, there existed anything in the organism of man's brute ancestors which would be a natural and continuous incentive for the active use of intelligence.

It is probable, from the disabilities named in Chapter I and the absence of hair, fur and thick hide, that during this long interval our brute ancestors frequently served as a choice article of diet for the great contemporary monsters and carnivoræ, which rarely permitted isolated specimens to reach that age when the bones have hardened sufficiently to make them difficult to masticate.

This inference derives strong support from the extreme scarcity of human fossils. At the same time it offers a plausible explanation of this unique phenomenon.⁴ Under such

4. Organic remains can only be fossilized when air, germs, water, etc., are excluded, or when the remains have been hermetically sealed. But this applies to all such remains equally, and, there-

circumstances, if any of our brute ancestors of that period were distinguished by any peculiarity, not possessed by other creatures, tending to stimulate them in the use of whatever degree of intelligence they were endowed with, then this slight difference in incentive to its use might offer a point of departure, a plane of cleavage, where the small end of the wedge of natural selection might enter, and this, in practically infinite time, might lead to a degree of intelligence such as is displayed by the most advanced minds of our generation.⁵

fore, does not explain the unique scarcity of fossil human remains, neither can this be explained by the assumption that the upright brute is the most recent form of mammalia. For in the scarcity of human fossils we have very nearly the only evidence and argument to support the above mentioned assumption. This would be reasoning in a circle. If it is contended, however, that the upright brute is the most evolved form of life, and that for this reason it follows from the theory of evolution, that it must be the most recent, then the reply can be justly made, that by the most evolved form is meant, "the form most adapted to its environment," and that the first chapter of these essays proves most conclusively that the upright brute, of all mammalian types at the time of its first appearance, was the least adapted to its natural environment. That adaptation only came after the unadapted natural form was supplemented by artificial means, viz, clubs and missiles. It is not at all improbable that the two-footed brute is a variation from a kind of brutes now extinct, which were the ancestors of the quadrumana, as well as of the bipeds. This, in fact, is a belief expressed by Charles Darwin and a number of his most eminent contemporaries and followers. On this theory the human type may be the more ancient of the two and it requires evidence to prove its assumed recency.

5. To account for the wonderful survival of the two-footed upright brute, it has been suggested that, in the earlier generations, before the expansion of intelligence and the adoption of sticks and missiles had taken place, our ancestors dwelled in some favored spot where no fierce or powerful competitors or enemies existed; that there they acquired a high order of intelligence and became proficient in the use of tools and weapons, and then issued forth to conquer the earth. This is obviously a purely arbitrary guess suggested by the story of the garden of Eden. Only a miracle could have kept such retreats from being overrun, by man's competitors and enemies, or

For when, during a long period, measured in this case probably by hundreds of thousands, if not millions of years, destructive agencies eliminate the great majority of certain creatures before they can reach the reproductive age, then natural selection is able to work on a *very small margin*, and still by the accumulation of many of these small margins from generation to generation, through many ages, to accomplish astonishingly cumulative results. For natural selection affects both sexes, and the small margin, possessed by each individual joining in the reproductive act, gives to the offspring a hereditary tendency of two such small margins. The old story of the grains of wheat asked for by the inventor of the game of chess, is a striking illustration of the stupendous cumulative possibilities of such a process of addition, which makes progress as the powers of two.⁶ The nature of this incentive will be discussed in Chapter III.

from leaving to posterity some evidence of the former existence of these asylums. Furthermore, the unique and enormous expansion of human intelligence would seem miraculous, if the helplessness of our ancestry and the absence of such hypothetical safe retreats had not been the inevitable exciting cause of it.

6. The story runs that the inventor, when requested to name his own reward, asked for two grains of wheat for the first square, double that for the second, double that for the third, and so on to the sixty-fourth. To express, in grains of wheat, the price of the sixty-fourth square, requires a figure of twenty-two integrals, and by doubling this figure the price of all the sixty-four squares is obtained. From an estimate of 200 grains of wheat to the cubic inch, obtained by trial, it follows that for 1,000,000 grains it takes three cubic feet, and the whole number of grains of wheat necessary to pay the reward requires a space of 20,000,000 cubic miles to contain them. To form an idea of so enormous a quantity of wheat it may be helpful to state that it would be sufficient to cover the whole surface of the earth, both land and water, to a depth of about 300 feet.

CHAPTER III.

FORCING THE GROWTH OF INTELLIGENCE.

In the two previous chapters the aim has been to make it clear to the reader that, firstly, with the beginning of those slight physical differences which distinguish mankind from the quadrumana, the race would have been doomed to speedy extermination except for the wonderful progress of human intelligence; secondly, that a higher type of intelligence, like all other new traits, must have emerged from small beginnings through variation by sexual reproduction; thirdly, that a special incentive must have existed in the human race, which is not found in any other, to make our brute ancestors exercise their intelligence, more extensively than other genera do.

It has already been mentioned that the higher elevation of the organs of sight and hearing increases their potential availability directly as the square of their distance from the earth, and that in the human race this exceeds the height at which most other creatures, even those much larger than man, habitually carry these sense organs.

The largest quadrupeds, which habitually carry their eyes higher than man, excepting possibly the giraffe, are yet at a disadvantage compared with him, because in looking backwards or sideways his head pivots easily on the erect vertebral column. While they, in executing these movements, have to curve or even double the joints in the backbone horizontally. Thus has the upright attitude directly caused man to survey a wider field of vision, sound and odor, and, there-

fore, to perceive a greater variety of phenomena in his environment than do any of his competitors. This constant influx of a much greater variety of experiences cultivates activity and energy of the mental processes, and educates in the knowledge of the relations and connections between phenomena, and thus the upright attitude is erected into a *constant incentive* to the use of the mental faculties.

For escape from danger, for pursuit of prey, for getting food, shelter, etc., this tendency to notice a greater variety of objects, if properly used, has much survival value. This value differs among creatures quantitatively, exactly as their intelligence; thus, if there is less intelligence,¹ (less perception, less adapted conduct influenced by such perception,) then there is less survival value. If greater intelligence, then greater survival value. Therefore, given conditions in which the great majority perish before the reproductive age, and, *cæteris paribus*, only the most intelligent of both sexes survive. A very small margin of intelligence above that possessed by others is sufficient to make them survive. These most intelligent specimens of one generation, according to the law of progressive accumulations explained in the last paragraph of Chapter II, would then reproduce a new generation, inheriting a still higher order of intelligence; of which, again, the most intelligent only would survive to reproduce another generation inheriting still another increase of intelligence, and so on for many, many generations.

Thus the incentive supplied by the erect stature is, by itself, sufficient to account for the *emergence* from variations, by selection, of a very intelligent type of humanity,

1. The word intelligence is used in the text, to designate the faculty by which experiences are acquired, preserved, compared, classified, etc., and combined into conceptions, inferences, conclusions, etc.

much more competent to battle in the struggle for existence against the odds arising out of its unique organism, than earlier generations were, but it does not explain the existence of a creature so enormously in advance of every other in intelligence as to acquire undisputed supremacy on earth, and the control of those inexorable forces of nature, which, although they were once the merciless masters of every living thing, our ancestors included, are now our tools and slaves to serve us as we choose. To account for this other causes must be searched for.

When looking at specimens of nude art one is often impressed with the grace and dignity of the human form in the upright attitude. Oblivious of the efforts and pains it costs babies, invalids and tired people to maintain this position, the mind, at such times, is likely to dwell only on the natural ease and unconcern with which it comes to healthy persons. Indeed, those unfamiliar with anatomy, may perhaps be surprised to learn that the muscles, tendons, bones, nerves, etc., concerned in maintaining this attitude, constitute a mechanism of higher complexity and greater adaptability than any found among the higher mammals below man. This wonderful adaptability of the human organism to the rarest and most delicate mutations in the environment, becomes most strikingly impressive, when we reflect on the fact that the bodily parts above indicated interact and co-operate with arms, hands, thumbs, fingers, limbs, feet and toes.

The creatures below man can, on the contrary, only respond to comparatively few general and fundamental demands made on them by the environment, such as recur with comparative regularity and frequency, to which they attempt to adjust themselves by defense, flight, pursuit, retirement to shelter, etc. Nor is the high degree of adaptability possessed by man required in their case. For their bodies are supplied

with natural coverings, which change in density to correspond with the variations in the climates of their habitats. Besides this they are supplied with natural means of offense, defense, and escape, and, therefore, susceptible to only a *minimum* of risks, as compared with the *maximum* to which brute-man was exposed.

For these reasons did the survival of the two-footed brute depend from the very beginning, much less on the natural adaptation of his organism to his environment, but much more on the *adjustment of his conduct* to those changes, both great and small, in the constantly varying order of the environment which occur from moment to moment. Conduct such as this cannot be accomplished by creatures less fitted than man for an almost infinite variety of compound concerted movements.

Before the bearing of the above facts on the increasing growth of human intelligence can be fully appreciated, mention must be made of a peculiarity of nerve cells. Other cells, when worn out by functional activity, die, are cast off and replaced, by new cells. Nerve cells, on the contrary, do not ordinarily die from exhaustion by functional activity, nor are then cast off and replaced by new cells, but merely shrivel, and subsequently, after being nourished, expand again, fill out, and resume their functional activity.

Memory, habit, and character, probably depend on this structural permanence of nerve cells, (see Appendix, Note 1) but we are not here concerned with the physical basis of conscious memory, etc., rather with a peculiarity of the nervous system which may perhaps be designated as its unconscious memory, and described as follows: When externally initiated currents of nerve force, after moving along afferent nerves and through various ganglia and centers, pass through consciousness, issuing thence through judgment and will, to

move along efferent nerves, into muscular tissues, producing correlated, concerted motions thereby, that is to say, conduct, then if, later, externally initiated currents cause the above recited series of actions to be repeated, from time to time, then the whole series, if repeated often enough, becomes organized in the nervous system, in such manner that, upon merely accidental repetition of a term in it, the whole series is re-enacted in its original order, but without the exercise of judgment or will, and often without consciousness.

If the series is simple, consisting of few terms, then very few repetitions suffice; if it be complex, consisting of many terms, then more numerous repetitions are required before the organization is accomplished.

It follows, then, that the few, simple, often repeated and similar adjustments, which creatures *below man* are competent to perform, will quickly become organized, and that, therefore, the occasions must be rare when their incipient intelligence, will, or judgment is called into action.

By contrast, the almost infinite variety of highly complex, coordinated actions, by which alone human life can be maintained, demands the frequent exercise of all these faculties, to their utmost capacity. And since the extent of adaptation must necessarily be proportioned to the degree of development attained by these faculties; therefore has their higher development important survival value. Thus does the complexity of the human body favor the growth and selection of an ever increasing human intelligence, and thus have the physical disadvantages under which our ancestors labored become the factors by which their intelligence was pushed forward. Let the reader bear in mind that this complexity of organism is an inseparable concomitant of the upright attitude, and a condition precedent on which the possibility of this posture depends.

The sense of touch is the only means by which creatures may become *intimately* acquainted with the qualities or attributes of things.

By touch we become aware of size, form, hardness, softness, roughness, smoothness, rest or motion, sharpness, dullness, hollowness, solidity. None of the other senses can directly inform us of these attributes of things, but certain impressions on the other senses are invariably connected with experiences of touch which do directly inform us of these qualities. Because of this *invariable connection*, our minds *automatically infer these qualities* from impressions made on the other senses, even when the direct evidence from the sense of touch is absent. It may seem as if by sound, hollowness and solidity could be distinguished, but *if touch* had not beforehand taught us *the nature* of hollowness or solidity, the respective sounds could never teach us that lesson. Touch, even here, supplies the primary experience.

By sight we can only distinguish *lights, shadows, and colors*. If touch had not previously made us familiar with things and their qualities, the seeing only of lights, shadows, and colors would give us little, if any knowledge of their nature.

The feelings of muscular tension produced by expansions and contractions of the iris, also those caused by the shiftings of the axial direction of the eyes, may seem capable of directly inducing knowledge of size, form, etc.; but we perceive this to be an error when we reflect that the former movements are caused by changes in the amount or intensity of light, that the latter indicate *relative* location only, and that objects differing widely in magnitude may, at different distances, if they subtend the same angle of vision, look as if they were the same in size. A line of reasoning similar to the above would apply, a fortiori, to the

senses of sound, smell and taste. It follows then, that touch is the only sense by which we acquire *primary* experience and familiarity with things and their qualities.

Never before, but only after, this original experience and familiarity has been acquired, can the other senses save us from the slow and sure process of identification by touch. Often a glance or a sound, more rarely a taste or a smell, will instantaneously inform us of a thousand things, qualities, relations, possibilities, originally made familiar by touch. Thus these other senses, and more especially sight and hearing, are merely useful in extending and multiplying the uses of the sense of touch. Sometimes the sensations received through sight and hearing inform us of the nature and qualities of objects great distances away. At other times they leave us seriously in doubt as to these. In such cases we aim to approach near enough to touch, and when we have touched, the information obtained by the sensations of contact we regard as absolutely trustworthy. Thus all our knowledge *primarily depends* on the sense of touch. Our other senses would leave us forever deplorably ignorant of the nature of the world around us were it not for the acuteness of this sense, specialized in our hands, fingers and thumbs.

How was the unique superiority and acute sensitiveness of the human sense of touch originated and preserved? Whether running, walking, jumping, climbing, or standing, the human body is supported in an upright attitude by resting, by means of the legs, on the soles of the feet. This prevents the finger tips, fingers, and hands from becoming calloused, or from having their sensitiveness impaired by frequent contact with the ground, or by friction or concussion against it, or by serving as supports to the body. Their use can thus become *more exclusively* devoted to handling,

pulling, pressing, *feeling*; the latter being an ever present, unavoidable element in every one of these other actions.

Thus a sensation indicating the nature and properties of the things touched accompanies every use made of the finger tips, fingers, and hands. We learn the nature and properties of our environment while we handle, pull, press, etc., and our knowledge increases in spite of carelessness and inattention, by every use made of hands, fingers and finger tips. Given an ignorant and helpless brute, with the human body, and the upright attitude naturally follows. Given the upright attitude and, *cæteris paribus*, the growth, cultivation, preservation and selection of an ever more acute, more sensitive sense of touch is assured. No other creature has this advantage; *none ever could possess it*, without combining in its physique the upright attitude, with the comparatively short arms, fingers, thumbs, and hands as formed in the human body.

How much sense of touch do the creatures below man possess? Aside from the elephant and the quadrumana, hardly any. The elephant has a refined sense of touch in the finger-like organ at the end of his trunk, but, being equivalent only to one isolated finger, its educative use and scope is very limited. Yet, there are good reasons for the supposition that, *by virtue* of it, the elephant has developed into the most intelligent of all beasts below man. It would cause much suffering and incapacity to quadrumana if they possessed a developed sense of touch in their finger tips and thumbs. For these, in their case, touch the ground or the tree in locomotion. *Not* delicate skin, covering a fine network of specialized sensitive nerves, is needed here; but, on the contrary, tough, thick skin, callosities, and nails to protect against cuts, scratches, etc. Therefore natural selection seems to have eliminated, in these four-handed creatures,

whatever acuteness the sense of touch may have formerly possessed.

Other sub-human mammalia can hardly be supposed to possess any sense of touch worth mentioning. Their thickly calloused toes, armed with long, sharp nails, etc., cannot be supposed to *supply sensations* indicating the qualities of things they come in contact with, more definitely than we experience when, in a certain social game, we are blindfolded and made to examine the faces of persons by means of a long-handled spoon held in the hand.

Some of the quadrumana can stand erect, but it is not a natural or comfortable position for them. Most birds naturally have an erect posture, but only rudimentary sense of touch. Bats seem to possess acute sense of touch, but like the feelers of insects, etc., it is adapted only to the avoidance of collisions, and not at all to the making of fine distinctions, as is the human touch.

Cats, rats, mice, many snails and insects, and some other animals have long hairlike processes on their faces, popularly supposed to be organs of touch, called feelers. They can, however, serve no such purpose as the human fingers and thumbs, because of the isolation of the protruding fibres and the distance between them.

That, *cæteris paribus*, the acuteness of the sense of touch depends on the coexistence with it of the *upright attitude*, has important bearings on subsequent arguments.

It appears then, that man alone has specialized, in his finger tips and thumbs, a highly developed, acute sense of touch, adapted to distinguish a wide range of sensations, indicating many and various properties and powers possessed by the objects in his environment; knowledge of which must forever remain inaccessible to the rest of the living world. This unique power possessed by man, obviously has great sur-

vival value, which differs in individuals according to the degree of the general intelligence possessed by them. Here, then, we have come upon a third and greatest of the agencies which forced the growth of human intelligence.

Thus the emergence of an ever higher intelligence has been forced, in the human race, by the convergence of three separate causal agencies, viz., the erect body, the exceptionally complex organism on which the possibility of the erect body depends, and the highly specialized sense of touch which is impossible without the erect body, and, therefore, a unique feature, peculiar to the human race. For this reason has it been impossible in the past, and seems impossible for all future, that any living creature of any past or present type, could ever develop an intelligence, comparable in extent, or quality, to that possessed by average humanity since the dawn of history; but, many thousand generations before that dawn, man's growing intelligence had already become an important element in his make-up, on which his survival depended.

Thus the conclusion is reached that those same slight structural changes, on which the upright attitude depends, and which brought so many evils upon our two-footed brute ancestors, were also the efficient agencies to force the wonderful growth and manifold expansion of the primitive intelligence with which they were originally endowed.

PART II.

OTHER PSYCHIC AND ECONOMIC RESULTS.

- CHAPTER IV. Survival Value of Hiding.
CHAPTER V. Survival Value of Temporary Support.
CHAPTER VI. Survival Value of Permanent Support.
CHAPTER VII. The Family, Monogamic Marriage, Economic Dependence of Woman, The Home.
CHAPTER VIII. Complementariness of Sexes on Lines *Not* Related to Reproduction.
CHAPTER IX. Concerning the Origin of Warfare and the Division of Mankind into Classes and Masses.

APPENDIX.

- NOTE I. On Memory.
NOTE II. On Altruism.

CHAPTER IV.

SURVIVAL VALUE OF HIDING.

Reptiles of the crocodile type can do considerable injury with their tails; and horses, asses, and their congeners, possess a mighty means of defence in the hoofs of their hind legs. Allowing for these and a few other unimportant exceptions, it may however be laid down as a general rule that for attack, protection, and defence the forward end of quadrupeds is the effective part. For protection we find here the shoulders, breast bones; fore legs, and skull, which form, figuratively speaking, a strong rampart or protecting screen behind which the lungs, heart, stomach, and other viscera and vital blood vessels, may repose in comparative security.

Being in addition shielded by the dorsal bones and vertebræ from above, by the hip bones and hind legs from behind, these vital organs are practically free from liability to direct injury by either an attack, collision, or impact, unless it comes from underneath. In this forward end are also situated the natural armaments of the creature, that is to say, the means for inflicting injury and death. Here are the sharp incisors for biting and tearing; the tusks, horns, fangs, claws, etc. Therefore, if a four-legged brute can but manage to keep his front turned towards his antagonists, his vitals are in the safest possible position, and his powers for inflicting injury and death are at the points of greatest availability.

The same holds true of birds; but by no means of the two-footed upright creature, primitive man, Mother Nature,

which has so bountifully supplied other mammalia with the means of offence, defence, protection, and escape, had left him naked and entirely unprovided. Hampered besides by a deficiency of valves in the blood vessels where they are needed, and a surplus where they are worse than useless, with exceptional liability to femoral and inguinal hernia, with his vitals; including the femoral artery, prominently exposed right in front, his condition was desperate indeed. The more so, since these exposed parts are situated at nearly the same elevation above ground as the sharp teeth, tusks, horns, claws and other natural means of offense, possessed by his most common competitors and enemies. Even sheep and goats and other timid or poorly armed creatures which he probably pursued for prey, long before he domesticated them, might claim these advantages over him.¹

In those early days, before our brute ancestors had learned to arm themselves artificially, the struggle for existence among the higher mammalia, in so far as it depends on race and individual competition, must inevitably have been of far greater severity than indicated by present appearances.

Wild brutes were much more abundant in tropic, semi-

1. It has not been thought necessary to include the frontal exposure of the reproductive organs among the disadvantages of the upright attitude. But it is a feature, unique in the human race. In quadrupeds these organs are concealed and protected equally with the vitals, and by the same means mentioned before.

Does not this frontal exposure of the reproductive organs explain the existence of a psychic peculiarity which distinguishes the human race from other brutes, viz, sex modesty? This explanation is the simplest and most natural and conforms to the rule of parsimony.

Chastity is quite a different thing. For it refers to the exclusive reservation of the reproductive organs of one individual to the use of a special individual of opposite sex. Only the absolute power of man over woman could have originated and selected such a trait.

tropic and temperate climates, than they are found today. For, since those times, there has been an agency at work, incalculably more destructive of mammalian life than all other known causes, viz., the murderous ingenuity and energy of our artificially armed brute-ancestors. Other predatory brutes, even the fiercest and most cruel among them, take life or inflict bodily injury, only when impelled by the primary instincts of self or race preservation. They kill creatures of other races than their own, for food. They defend their own bodies and their lives against the aggressions of enemies. They fight with the males of their own race for the possession of females. They defend the food they have captured, the places in which food or water may be found, the security of the cave, nest or other abiding place, which they have occupied or constructed, and the bodies or lives of their females and young, against any aggressors. But a primary instinct or necessity is *always* the motive or cause of any and all their destructive activities. Obviously, therefore, the results of their life destroying energies must be narrowly limited in extent, so long as life in general remains abundant; and it must remain thus, when no other destructive agencies are at work. For all the higher mammalia are admirably fitted for the struggle for existence, by being abundantly supplied with means for offence, defence, protection, escape and rapid multiplication.

But now there enters upon the scene a creature most miserably discriminated against by the physical forces of the universe. A creature absolutely void of all natural means of offence, defence, protection, escape, and with a pitifully slow rate of multiplication. A creature afflicted with numerous perilous natural disabilities, infirmities, defects and disadvantages of physical structure. A creature *by nature* utterly unfit for the physical struggle for existence, and kept,

therefore, during many times many generations, close to the limit of extermination, escaping only by a very narrow margin; naturally selected, therefore, during these long generations, on the line of greatest muscular strength, greatest agility, greatest toughness, greatest courage, ferocity and cunning.

This creature, after a long period, learns artificially to arm himself with clubs, missiles and with fire, and applies all the qualities slowly acquired by selection to the use and handling of these artificial appliances. He kills not only for the purposes above mentioned, which move other creatures thereto, but he kills and tortures for pastime, for amusement, for practice in the skill and art of killing and maiming and for the fun of competing with others practicing the same art and skill. All this practicing cultivates his passion for such activities, and that passion must be fed by more practice, and so it grows and increases. "It's a grandly beautiful day, full of life and joy, let's go and kill something"—is an exclusively and distinctively human sentiment, improperly ascribed to the English nation.

And how innumerable are the applications and extensions of this love for killing, maiming and torturing. Man kills to exterminate pests; to stop interference with his claim of supreme control of the earth and of its resources, and of the application of all that lives and grows on it, to his own special whims, uses and purposes. He kills some creatures for their feathers, others for their hides, others for their furs, still others for their horns, antlers, tails, tusks, jaws, brains, livers, testicles, or even for the oils, fats and other secretions of various glands, etc. He not only kills, but exterminates whole races and genera. Only the infinitely small have thus far baffled his ingenuity and passion for killing. Man follows these cruel and destructive

practices, has the character adapted to them even today, after being for at least several thousand years under the influence of "religion, law, government, social and family relations, industry, commerce, cooperation, art, literature, education, etc., etc." What must have been his character and conduct before any of these agencies had even begun to modify them? What must they have been when the most miserable and helpless brute of all was, by the use of clubs and missiles, suddenly transformed into the most powerful? What fearful wholesale destruction of life must have inevitably resulted therefrom? There are still other, though lesser, reasons for affirming, that mammalian life must have been indescribably much more abundant on earth in the period prior to this change in the estate of our brute-ancestors, than it has been since.²

Quite a number of species and varieties of mammalian creatures have been exterminated by man within the last two centuries. Many more, not now existing, we find men-

2. It is note-worthy that, in our time, the sport of hunting is most indulged in by the so-called upper classes; those who have wealth, power and social position, and who usually are the supporters and professors of some so-called religious creed, which they pretend to derive from the gentle Nazarene. Of all so-called sports, however, fishing seems the most cruel. To enjoy having a living creature dangle for hours in agonizing and hopeless struggles, until the last spark of life ceases, displays a refinement of fiendishness which can hardly be excused on the plea of thoughtlessness.

To man also belongs the distinction of having exercised the greatest ingenuity in the invention of wonderfully cruel tortures for his fellowmen, and in lengthening the lives of the sufferers so as to be able to inflict more tortures. And this has been done in the name of religion; but evidence is not lacking that the real objects in such cases were pelf and power.

It is also remarkable that man is the only living thing which lends itself to being disciplined into surrendering all self-control and then, at the command of another, inflicting agonies and death on fellow creatures, which have done him no harm, possess feelings like his own, and against which he has not the slightest reason for resentment.

tioned in the literature of earlier centuries; and it seems worth while considering whether the accounts given in myths, traditions and earliest literatures of the monsters and dragons of the primal age, killed by heroes, are not more rationally explained than heretofore by believing them to be accounts, tainted by the inaccuracy and tendency to exaggeration of untutored minds, but yet of creatures which have really existed and have been exterminated by man.

Many instances are credibly reported since historic times, when certain districts were, for a decade or two, stripped of all human population, and later found *over-crowded with many kinds of wild mammalian brutes*.

Because it is not true, therefore, can it not be fairly objected, to a small part of the above argument, that cats, which have caught mice, sometimes show as cruel a disposition as man. Whenever cats hunt mice, they are moved thereto by the primary instinct of a carnivorous animal. The playing of the cat with the mouse, before killing it, is obviously the *artificial result of domestication*, which supplies the cat with more than enough food to satisfy hunger, and yet cannot abolish the primary instinct, which makes her catch mice. Then domestication cultivates in the cat the desire for human approbation, and to obtain this she shows off her pranks with the live mouse. Besides, a cat has not the intelligence which would restrain cruelty by a sense of the suffering inflicted.

To recapitulate: The natural enemies and competitors of man's brute ancestors, are all so well supplied with means of offense, defense, protection, escape and multiplication, that the ordinary natural agencies, which tend to keep life within bounds, were insufficient to prevent their increase to the extent of crowding the area over which our early progenitors had scattered. When these latter had learned the use of

clubs and missiles, however, they devoted themselves to the destruction of life with such wonderful ability and passionate energy and perseverance, that the contrast between the redundancy of mammalian life before that period and its scarcity afterward, must have been enormous.

The conclusion then is safely established, that when our brute ancestors first learned the use of clubs and missiles, they lived in a habitat densely crowded with mammalian life, among which the larger carnivora must have been a numerous class, because the creatures on which they habitually feed were so very plentiful.

A crowded habitat necessarily implies *severe and close competition* for the primary necessities of existence, such as food, drink, shelter, opportunity to reproduce, etc., etc. Severe and close competition is the condition which makes the struggle for existence *most intense*. When the struggle for existence is the intensest, natural selection is *most exacting*. Only the most competent among the races and varieties survive, and within these, again, only the most competent individuals. Such conditions could only react favorably upon the average excellence and numerical strength of the higher mammalia, which are so well provided with means of offence, defence, protection, escape and multiplication. But our brute ancestors, while selected most exactly with reference to strength, toughness, agility, courage, ferocity and cunning; and while existing by ones, twos and small family groups scattered over a large territory, could, obviously, maintain their lives only by the almost *unremitting exercise of all their physical powers*, under the direction of their rapidly increasing degree of cunning.

And what was the general character of the conduct by which these few succeeded in maintaining a brief existence against such fearful odds? Self-evidently cunning could

not be exercised, in the manner in which it is used today. They were probably not fighting against each other, unless on exceedingly rare occasions. They could not outwit their fellows, competitors, or enemies, by shrewd bargains, keen deceptions, legal trickery, etc. Clearly, their cunning could only be made available in directing their conduct in contests with or in flights from enemies or competitors, pursuit of prey, securing food or drink, and selecting places for shelter and maintaining these against other creatures trying to dispossess them. These limitations of conduct imply *violently energetic running, striking, kicking, jumping, leaping, etc.*, on the physical side, and alert, circumspect and cleverly concerted arrangement of these motions on the mental side. Evidently only the most competent could maintain themselves by such conduct. The lame, the halt, the infirm, malformed, deformed, or those in any way *hindered, hampered, impeded or interfered with by any physical departure from compactness, coordination, or perfect adaptation to violent movements, were evidently incapacitated—utterly unable and unfit to maintain* their lives in the struggle. And what is the bearing of these conclusions on the survival chances of the human brute-females in the last stages of pregnancy?

Evidently the natural protrusion and extreme distension of the abdomen, at such times, intensified the risks arising from the exposure of the vital parts. The increase in weight, bulk and pressure, in the lower forward part of the pelvic region caused the body to be easily unbalanced. The anterior, posterior, lateral and round ligaments, which in quadrupeds prevent the gravid uterus from pitching too far toward the diaphragm, are at least insufficient, if not entirely unadapted to such a purpose, in the upright human female. Accurately adjusted and sudden, vigorous, or vio-

lent motions and efforts are, therefore, if not impossible, at least so very dangerous to the life of the mother and embryo, as to be *incompatible with race survival*. But it has been demonstrated above that such movements were *absolutely necessary* to maintain and obtain the barest primary daily necessities of existence. If, then, none of these actions necessary in defense of life, pursuit of prey, of food, or in obtaining water, or in escaping from enemies, were possible to the pregnant females, *how* could they then save their lives by intellectually initiated conduct at all? The race was doomed, and its higher intelligence utterly unavailing, unless they could thus save themselves.

The males, immature females and virgins might be ever so able to preserve their lives, *yet that could not secure the survival of the race*, for in the end, this *unavoidably depends exclusively* on the preservation of the pregnant females and embryos. And since the pregnant females were prohibited by their condition from resorting successfully to any of the modes or class of actions before mentioned, there remained but one line of intellectually initiated conduct *possible for them* with chance of success, and this was the selection of suitable places for their own concealment. *Cæteris paribus*, and in average cases, only so long as they continued in concealment might their lives and those of the embryos within them remain available for the perpetuation of the race.

Even if it had not been demonstrated in a previous chapter, that the assumption, that man's two-footed brute-ancestors used clubs and missiles from the very beginning, is utterly untenable; that is to say, if this supposition, for the sake of argument, is assumed to be true, that would not avail the brute-woman in the last stages of pregnancy. For the violent motions required, in the effective defensive use of these weapons, would be as dangerous to the lives of the

females and embryos as the enemies against which they were supposed to use them.

How did the needful tendency to hide arise in the natural course of events? During the last three or four weeks or months of pregnancy, the violent efforts required from them in contests with competitors and enemies, or in attempts to escape from them by flight, must daily have become more difficult of execution, more barren of success, more productive of painful and distressing symptoms to the females, until the limits of endurance were reached. At this point the victims, under an overwhelming sense of their desperate helplessness, would be unable to prevent their natural intrepidity from giving way to a supreme desire for seeking safety by hiding. For this impulse had been increasing, *paripassu*, with their helplessness. A tendency to hide during the last stages of pregnancy under conditions then existing, obviously had *great survival value*. After coming into existence, either in the manner above outlined or in any other, it would, therefore, gain strength and fixity by natural selection. The validity of the above arguments is not affected by any assumed brevity or length of the female's period of incapacity, whether it lasted days, weeks, or months, nor by the degree of it. *The unavoidable admission* of some impairment of their full vigor, for a brief or long period, is sufficient to sustain them.

Conditions similar to those above alluded to, which made the hiding habit of the pregnant females a necessity in the primeval era of the human race, do not exist in the case of the anthropoid apes. It is true that these creatures can stand and move about in an almost erect attitude. However, they have not feet (distinguished by the hallux forming a natural fulcrum in walking), but hands, on their lower or posterior extremities; nor is their foramen magnum situ-

ated, as in man, as it must be for convenient and natural uprightness, *a little behind the centre of the base of the skull*. It is, therefore, more natural and far more easy for them to be, and move about, on all fours. Their pregnant females, in this latter attitude, are no more liable to injury from falls and stumbles, and their vitals no more exposed, than those of ordinary quadrupeds or baboons. The extraordinary great capacity of the thoracic cavity of these animals, and the massive strength of the bony structures surrounding it, and the adaptation of the pelvic bones and ligaments to keeping the uterus securely and comfortably in position, give them an advantage in the struggle for existence: to which another must be added, viz., their long, strong arms and limbs, supplied at the extremities with hands, specially adapted to grasping and holding on to branches, which give them chances of escape, only surpassed by flying creatures. And these latter are at a disadvantage compared with them, for it requires constant and great effort to sustain themselves in the air; but apes and anthropoids can be at rest and comfortable after escaping to a place of security in the trees, and can live and feed and breed there. Their hairiness and tough hides protect them against injuries from accidents, violence, changes of temperature or climate, and at the same time their color makes concealment easy for them, when in the foliage of their natural habitats. In no way are there any parallellisms between their condition and that of the dangers and disabilities of the child-bearing human female.

To sum up the argument: the perils and disadvantages resulting from the upright attitude would have determined the struggle for existence against the survival of man, if his superior intelligence had not initiated various modes of conduct, competent to balance, partly balance, or more than balance, the physical advantages possessed by his competitors

and enemies. None of these modes, however, although useful to other members of the race, could be made available for the pregnant females. There remained, to them, therefore, but the one saving resource of continued concealment. However, as no kind of creature can escape extinction unless its pregnant females are preserved, and since the human race has survived, therefore, the conclusion is justified that at a very early stage in the existence of our race the females acquired the habit of concealing themselves during a part of the period of pregnancy, and that this was one of the means by which the race escaped extinction.

A point has been reached here, where a differentiation in habits and activities on the sex line may be looked for, because the males had no occasion to practice self-concealment, but could continue active lives in the open.

CHAPTER V.

SURVIVAL VALUE OF TEMPORARY SUPPORT.

Animals in a state of nature may usually find drinking water in ample quantities, in fixed locations, and contained in hollows which are self-replenishing. Creatures which have found water are, therefore, but rarely compelled to go in search of new places or supplies, but may, whenever necessity or desire prompts them, provided they possess the intelligence to recall the whereabouts, return to the spot where they first slaked their thirst. Moreover, the act of drinking is of comparatively brief duration. It is therefore not necessary for feeble or timid creatures, which are hunted by the more powerful, to run special risks in relieving their thirstiness, for during the hours when their enemies are drinking they can avoid the places where water is found, and resort to them at other times.

The case stands differently with food. The competition for this is usually far more severe, and the quantities of it are not self-replenishing with available rapidity. Many brutes, therefore, are obliged to expend much time and energy, and to risk both limb and life in obtaining and consuming food. Brute-man must be included in this class. For he could not feed on grass or herbage, as cattle do, nor could he maintain a fruit diet with anything like the ease of monkeys, squirrels, or other tree-inhabiting brutes. For his upright attitude, and feet unadapted to clasping, grasping, or holding on, particularly unfitted him for tree life.

His teeth, which can neither be said to be specially fitted

for a particular diet nor extremely unsuited to any kind, possessed for these very reasons a limited and yet valuable degree of adaptability to an almost infinite variety of foods, more so than those of any other creature. That is to say, primitive man was better fitted than any other animal for what is termed omnivorousness. Nor can it be doubted that this came about by natural selection. For being, in the struggle for existence, physically at so enormous a disadvantage, if he had been limited to one or a few articles of food, his competitors, feeding on the same kinds, being so much better fitted, would so easily have gained the advantage over him as to drive him out of the field of competition, and thus lead to the extermination of the race.

Being able, however, to subsist on almost any kind of diet, though not nearly so well on any particular kind as the creatures which competed with him for it, it must soon have become natural for him to take a little of one description here, and a small quantity of another kind there, as opportunity favored, or risks were minimized. Intelligence would in various ways assist effort in this sort of conduct. Withal it is evident, however, from the many disadvantages under which he labored, that he had to satisfy his hunger usually in the midst of many dangers, and at the expense of much time, effort, and ingenuity. The greatest possible degree of adaptability to the utmost variety of foods, and a disposition to take only a comparatively small quantity of any particular kind at a time, would, therefore, be naturally selected.

In the last chapter it was ascertained that the pregnant human females could preserve their lives only by hiding and remaining in concealment during the whole period of their incapacity. The question therefore arises, how would they, during this time, obtain food and water? As to water, the query may be dismissed, for it has been seen above that

creatures of intelligence *could* manage to obtain this at times when the act was not dangerous to them, and it is thinkable that the pregnant human females would ascertain such times and make use of them wisely and stealthily. But as to food, the question remains unanswered. With reference to time, it is evident that they must go in search of food during daylight. For their eyes were not nearly as well fitted for seeing in the dark as those of their enemies and competitors, nor had they an acute sense of smell to guide them, and their food was hard to find and scattered. Next, regarding the locations for finding food: these are easily classified as situated within their places of concealment and without. If without, then the females would have to leave their asylums, and, during the long search for food and while consuming it, expose themselves to the assaults of their enemies and competitors; therefore, the benefits of concealment would be lost, the pregnant females would perish, and the race could not survive.

If within, then there are again but two contingencies. Either the food supplies must exist naturally within their retreats or they must be brought there artificially. Let us firstly consider the possibility of hiding in localities where supplies of food existed naturally. Such places quickly become the most frequented haunts for creatures of various types, and therefore utterly unfit for concealment. For this very reason they also become the favorite hunting grounds of carnivora, therefore totally unsafe as abodes for the helpless and incapacitated. All other possibilities by which the pregnant human females might have obtained their food being exhausted, the only possible conclusion is that it must have been brought artificially within their hiding places. We need not consider the alternative of food being carried within their asylums by the females themselves, for this

could obviously not be done unless they went in search of it outside their retreats, which has been disposed of above.

If some one says: The females may, in anticipation of pregnancy, have stored food in places of concealment, then the reply is, that this either takes a perfected instinct for granted, which is contrary to the facts, or else assumes a degree of systematized knowledge and planning out of the question in brute-man.

Having ascertained the utter futility of every other alternative, we are now face to face with this most remarkable conclusion, that the genus homo, when still in its earlier brute condition, escaped extinction only because food was placed within the hiding places of the pregnant females by some artificial agency outside their own persons; that a race has survived, multiplied, and become supreme master of the earth, harnessing even the almighty forces of nature to the chariot of civilization, which is the offspring of a helpless brute that could not possibly have escaped extermination if its hiding females had not, during a portion of their period of pregnancy, lasting several days, weeks or months, been artificially provided with food within their retreats.

Miracles are by their nature excluded from any discussion which lays the least claim to being rational. The hypothesis that some non-human brutes had regularly, for many generations, gathered food fit to nourish human females, and brought it to them within their asylums, may, therefore, be unhesitatingly rejected. For it postulates a marvel without precedent, a miracle greater far than any the ingenuity of the theologians has ever invented. No living creature, unless it be a human being, can reasonably be supposed to have acted in a way which calls for such accurate adjustments of means to ends, unless by a perfected instinct, which would have taken many thousands of genera-

tions to emerge by natural selection into efficiency. During the period of its inefficiency the human race would have perished, and if there had been such an instinct, some traces of its former existence would surely have been discovered before this. Since neither has happened, the hypothesis is too absurd for consideration. It is, therefore, certain that human beings must have provisioned the females in their retreats, and the questions arise, were they male or female, or sometimes of one and sometimes of the other kind? What was the relation between them and the females they fed?

When man had learned the use of clubs, missiles and fire, in other words, when he had learned artificially to arm and warm himself, his survival was no longer in question, but abundantly secure. Higher intelligence applied to the use of these aids, and his wonderful adaptation to handle them skillfully, secured him advantages far outweighing the infirmities, disabilities and perils brought upon him by his physical uprightness. Even a pregnant female, with fire, clubs and stones within reach, and with vigorous habits engendered by living in the presence of frequent dangers, might make some sort of defense against some of brute-man's enemies and competitors.

But the problems discussed in these essays, be it distinctly remembered, refer to that long period which commences with the first appearance on earth of the two-footed man-brute, and which ends when he began to arm himself artificially. It has been demonstrated that gregariousness would have operated against his survival during this period. The habitual collection in crowds or numbers of such helpless, vulnerable creatures, so easy to kill, without risk to their assailants; so easy to discover from the distance; so easy to eat without the hindrances interposed by woolly, furry, and hairy hides; could only have led to wholesale

slaughters by their enemies, and, therefore, taking the slow rate of reproduction into account, to the speedy extermination of the race. These reasons justify the conclusion that, during the epoch here discussed, creatures of the "genus homo" were found mostly wandering in search of food or hiding by ones and twos, and that so many as an adult male and female, with two or three of their young, was a rare and risky gathering.

Could the advantages have outweighed the risks of gregariousness? By no means. Unprovided with even the smallest means of offence and defence, what resistance could such creatures offer? Though assembled in great numbers, what possible injury or pain could they inflict upon their powerful enemies, armed with fangs, tusks, teeth, horns, poison glands, claws, talons, etc., protected by thick hide, shaggy fur, scales, etc., etc., Evidently none worth mentioning. Even the goat, the deer and the sheep have horns and sharp incisors and prognathous jaws, shaggy fur, and thick hides. The little peccary has vicious teeth in its protruding jaws. With these it can bite and tear and do this in places about the feet and legs, which a taller antagonist finds it hard to protect. The backs and heads of these little creatures, which are the only parts of their bodies exposed to an antagonist, are protected by the skull, vertebræ and ribs, and by stiff, prickly bristles. What a contrast from the man-brute's tall, bare-skinned body, fully exposing his vitals to his enemy.

The only possible use that such creatures could get out of gregariousness lay in this, that one might watch while the others rested or sought food. But, compared with the added risk of wholesale slaughter, this was small gain to a creature unable to feed on grass or herbage. The greater

safety was in remaining scattered, for the *enemies of man reproduced far more rapidly than he*.

Gregariousness did not begin to have survival value for man until he had learned to arm himself artificially.

Consideration of answers to the questions asked above may now be resumed. To perform the actions under discussion, a human being or human beings, must feel some sympathetic interest in the dangers and sufferings of the females.¹ Now what sort of human beings would answer to these requirements? and in what relation would they stand to the pregnant females? Would adult females, standing in the relation of friendship answer? Friendship can only arise in the associated (social) state, among creatures having at least occasional brief periods of peace and leisure to give opportunities for the amenities and joys, the experiences of similarity or complementariness of tastes, activities, etc., in which the sentiment of friendship has its roots. It seems, therefore, self-evident that such a thing as a long-enduring, steadfast, self-sacrificing friendship, without an instinctive basis, was utterly impossible to the scattered few of the race under the conditions then prevailing, which required the utmost efforts from even competent members, to barely maintain existence; and this reasoning discriminates with equal validity against either male or female friendships.

1. It is exceedingly improbable that the males had any notion of the reproductive results of cohabitation until long after permanent sex unions had become quite common. Nothing in the act of reproducing suggests the result to either sex. Even the female has no coherent chain of feelings to teach this mysterious connection; and from the consciousness of the male the knowledge is still more remote.

The reader must be warned against assuming that the connection between the gratification of the attraction between the sexes and the birth of offspring, as now generally understood by adult civilized human beings, was known or even suspected until long after permanent unions had become very common in human societies.

There remains, then, but one kind of human being, and but one relation which answers these requirements—a relation, among sexually reproducing creatures, as old as life itself, as strong as the intensest of all instincts, the deepest of all passions, abundantly capable of drawing and holding two human beings of opposite sex together—an instinct which unites them during that period of their lives when their bodies come nearest to physical perfection—which, although by nature only fitted to enforce compliance with racial need of reproduction, has yet in man acquired the power of elevating his intellectual faculties to their highest possibilities, of evoking and maintaining in him the heroic attitude of mind, of arousing sublime and beautiful emotions, of initiating bold æsthetic and artistic conceptions and the most beneficent and admirable aims.

When this powerful instinct in those primitive times had drawn a male and female together, there did not then, as now, exist legal, conventional or educational influences to mitigate or modify the force of the natural attraction, nor was there any dissimilarity in tastes, necessities, occupations or modes of life to cause them to leave each other's company in the intervals between the periodic stimulations of the instinct. In other words, there was an active, powerful force continually drawing them together and nothing to draw them apart.

Neither was it likely, when an attraction had been once established between two of opposite sex, that the affection of either would become alienated through the intervention of a more favored specimen of the other sex. For the number of living individuals of the race was very small, and for these few it had survival value to remain scattered by ones and twos, or at most in small family groups. It is, therefore, a safe conclusion that after two of opposite sex had been



companions they would remain so unless the exigencies of pregnancy parted them. Until that time, that is, during many days, weeks or months, they would hunt together, battle against common enemies, seek food, eat, drink, sleep and rest together. In this way, and during this long time of companionship, they would become more and more accustomed to each other's natures and habits, until little by little, through progressing pregnancy, the first feeble symptoms of approaching incapacity would begin to show in the actions of the female. A little less efficiency and agility in taking her share in the contests with enemies, a little less ease in holding her own in flight from enemies or in the pursuit of prey. This would gradually and almost imperceptibly force the male, without comprehending the mysterious cause which produced the changes in his consort's actions, to do a little more and a little harder fighting than before, and, for a little distance, to follow the prey alone when the female had fallen behind; to carry a little larger share of the food captured or collected to the common resting place, etc.

Thus, as, by slow degrees, her share in life-sustaining actions diminished, his would increase, and yet her portion in the results would not be less. This process would continue until she would be unable to give assistance to her mate in any violent encounters. Even before this, however, efforts to keep up her part in the fight and in the chase would make her liable to suffer pain from over-exertion for hours or even days. These tendencies would culminate in her being finally forced to remain in concealment while he would go forth alone in search of food and prey, portions of which he would be likely to bring to the place of her concealment, because the habit had been established during the long months of companionship. (See Appendix, Note 2, "On Altruism.")

So very gradually had his share in the efforts increased

without diminishing her participation in the food, that after she remained behind in concealment the surrender to her of a portion, sufficient for her support, would hardly be perceived by him as a change. In no other way is it natural, in no other would it be rationally thinkable, that food could have been provided for the pregnant females in concealment. It was brought to them by their male consorts. Since only in this manner could it come to pass: since the survival of the race depended on its occurrence, and since the race has survived, therefore, the conclusion is warranted that it happened in this way.

Such conduct is not confined to the human race, but has been observed among baboons and anthropoid apes; and male birds have been known to bring food to their mates during the period of incubation. Nor need one search far for the cause of this habit. Evidently it had survival value, especially in the case of man. For, in the struggle for existence, the tendency would be to preserve and multiply families in which the males had a disposition favorable to this trait, and, on the contrary, to eliminate those in which they had not. Natural selection, therefore, accounts for the fact that this habit has now become well nigh universal in the race.

CHAPTER VI.

SURVIVAL VALUE OF PERMANENT SUPPORT.

Parental wealth tends to lengthen the helpless infancy of offspring, and parental poverty to shorten it. For motion is always in the line of least resistance. When wealthy parents continue to provide for their offspring, long after the natural necessity for it has ceased, the infancy of the children lengthens by relaxation of the efforts which otherwise would be made by the young creatures. Contrariwise, when savage or poor parents lack resources, and are, therefore, obliged, in the search for them, to abandon their children before they are able to take care of themselves, under the operation of the same law, the helplessness of infancy is shortened by the putting forth of earlier efforts.

Thus far has the progress of civilization in large measure been characterized by progressively greater concentrations of wealth in the possession of certain classes. It is, therefore, reasonable to assume that among these classes, at least, the duration of helpless infancy has been lengthening ever since the beginning of civilization.

Here is not the place to discuss the question whether "the growth of human intelligence" has also contributed to lengthening helpless infancy in the human species, as contended by John Fiske. Whether it has or not, this is certain, that from the very first appearance of brute-man on earth, helpless infancy must have endured in this race longer than in any other. This follows as an unavoidable conclusion from physical uprightness, which involves a very com-

plex and delicate coordination and cooperation of many widely differentiated structures, bones, tendons, muscles, nerves, etc. It is, therefore, possible only after all these various parts have been developed, by exercise, into a considerable degree of precision and efficiency in their adjustments.

The arrangements subserving locomotion in most other animals are comparatively simple. Very little strength and precision, and but a small degree of coordination of four very similar, if not almost equivalent movements, is required to enable young quadrupeds to balance their bodies and move about. But in man, muscles about the back, chest, abdomen, neck and head, and in the toes, feet, limbs, hips and arms, must accurately cooperate in balancing the body for standing or moving about in the erect attitude. And because of this degree of complexity, this variety of cooperating organs and coordinated muscular contractions, a higher degree of precision in functioning is necessary in the human race, which can be attained *only* by allowing a longer period for development, that is to say, a longer infancy. And this reasoning and this conclusion applies to the "genus homo" from the time of its first appearance on earth, for the upright attitude has distinguished it since then.

During the lengthy period of their helpless infancy the human offspring had to be nourished, cared for, and protected by their parents, or perish. The survival of the race depended upon the disposition of the parents, or of at least one of them, to assume for a long period the burthen of providing the little ones with nourishment and protection. Whether the burthen was assumed by one or by the other, or by both, its assumption must have proved to be a very serious hindrance in the struggle for existence, to whichever accepted it. The survival of the race makes us certain that

on the average the parents of the race have not shirked their duty in this matter. Because of the naturally closer connection of the mother with the child, and of the feeding of it for a longer period by a natural secretion from her body, it is safe to assume that this burthen of feeding, caring for and protecting the child after the flow of milk had ceased or become inadequate for the nourishment of the rapidly growing offspring, fell upon the mothers of the race. The former process would gradually, unavoidably, blend into the latter. But how could the mother provide for her own maintenance and that of her child, care for it, protect and carry it in arms, and yet enter into the struggle for existence with any chance of success? And on her success depended the survival of the race! A female quadruped, a few days after delivery, may go in search of food unhindered by the offspring trotting at her heels. If enemies appear, the mother faces them, and the little ones keep at a safe distance or go into temporary hiding until the battle is over. Even if a young one is occasionally captured by an enemy, or disappears, the loss is not important to the race, for large litters are frequently reproduced.

But in the human race, one child, once a year, during a few years, comes very near being the limit of reproductive capacity, and this one, during the long period of its helpless infancy, has to be carried in arms by the mother whenever she goes in search of aliment, or it must be left behind unprotected and unprovided. Evidently, then, the survival chances of mother and offspring are not much, if any, better, after the birth of the latter, than they would have been shortly before, had not the male consort then come to the relief of the sorely troubled female. And in this case now under discussion, the same sort of relief must have come from the same source.

Such a proceeding had very decided survival value, and any families in which the male consorts showed a disposition to provide food and protection for their mates and offspring must have been selected for preservation, while those which were lacking in it were left to die out. Nor could natural selection neglect the extent or quality of this disposition. For if the males of certain families had a disposition and capacity to provide well and liberally and for a longer period, then the females and offspring had a chance to grow stronger, healthier, and better fitted for the struggle for existence, and those families, therefore, had the best chance of survival.

Nor does the matter end even here. For it can hardly be doubted that, in that epoch, the unrestrained reproductive instinct and the necessities of the race admitted of but short intervals, for the competent among the females, between the end of the helpless infancy of one child and pregnancy with the next; so that natural selection would sift out only those families for preservation in which the males were naturally disposed to provide for their females and offspring, as long as the reproductive period of the female, and the helplessness of any of the offspring lasted.

CHAPTER VII.

THE FAMILY, MONOGAMIC MARRIAGE, ECONOMIC DEPENDENCE
OF WOMAN, THE HOME.

The existence of four peculiar institutions, unique in the human race: the family, monogamic marriage, the economic dependence of woman, and the home, have been accounted for in the preceding chapters.

All four were traced to the earliest period of man's existence, and to physical uprightness, through the survival of the fittest, as a cause.

A vast amount of evidence, drawn from the reports of travelers who have lived for many years in barbarous or semi-savage communities, in order to study their customs, beliefs, and traditions, has been adduced by some writers in support of the contention that the tribal commune and the clan ante-date the family.

How can such a view be reconciled with the apparently conclusive evidence furnished in preceding chapters, that family relations closely resembling those of the present day, prevailed during the very dawn of human existence on earth? Only on the hypothesis (and it is legitimate to answer one hypothesis with another) that the *modern type* of family is a form of atavism, developed within the tribe or clan, *after* these social aggregates *had supplanted the primitive family*, by being of higher survival value. How could this come to pass?

When the use of clubs and missiles had developed the predatory type of men, who preyed upon their own race,

the existence of family groups, each consisting of a helpless woman and her children, from which the able-bodied male had to absent himself to go in search of food, became exceedingly precarious and liable to be wiped out suddenly or scattered.

The members of numerous family groups, which in time of peace had spread over considerable territory, in escaping from their predatory fellow men, by running away in many different directions, would tend to meet, in large numbers, at the natural intersections of their various lines of flight, and communes, tribes and clans might, under favorable conditions, arise out of these gatherings.

After tribes and clans had existed for many generations, and had gradually attained a high degree of organization and of internal security, then governmental, conventional, and ethical ideas may have resuscitated family groups, practically "de novo." For even the memory of their primitive existence may have been obliterated.

There should be noted, however, a fundamental difference which exists between the attractions which hold the family united, and the external coercive influence which bring and keep the members of tribes or clans together. These latter may be likened to compression.

Love, affection and mutual interdependence are the intrinsic factors which, through desire, voluntarily unite the members of a family group; by attractions akin to those which draw the ultimate particles of a substance to each other. But as a driving wind in winter will gather the individually beautiful snow crystals in shapeless heaps or drifts, so it required the coercive force of common danger to induce primitive human beings to exchange the natural freedom of individual and family life for the restraints of the tribe or clan.

Can it be asserted that the existence of tribe or clan *absolutely* ante-dated the *earliest primitive* human families? Not without denying the upright stature of the human race and its unavoidable consequences. For *human individuals* were the *only material* from which the tribe or clan could be formed. These individuals could not be anything else than the offspring of human parents of upright stature. During the long helpless infancy of such offspring, they and their mothers had to be supported by the father or perish. Support of mother and offspring, by the father, during a lengthy period, constitutes genuine family relations. Therefore, can the absolute priority of the tribe or clan not be asserted, without implying a denial of the existence of physical uprightness in man, which is absurd and contrary to the hypothesis.

That beautiful relation between two people of opposite sex, known as monogamic marriage, has, heretofore, usually been looked upon as one of the latest results of governmental, religious, and conventional regulations, enforced only within the highest types of civilized societies. From the preceding chapter, however, a very different view of the subject seems rational, namely, that this form of sex relation is the necessary result of permanent support by the male, and scantiness of population, which prevailed during the earliest periods of brute-man's existence.

During subsequent eras of warfare, the level of the adult male population may sometimes have fallen so very low that polygamy was the only remedy which could save the race or the tribe from extinction. It is possible that such epochs occasionally lasted for so many generations that the former existence of monogamic marriage was only remembered, if at all, as a tradition, or a reminiscence from a former golden age. This ideal, in subsequent periods of peace, may then

have been resuscitated and reinforced by governmental, religious, and conventional regulations, and this would account for its present existence.¹

The *original* economic dependence of woman, mentioned in the last chapter, began only when the infirmities of the final stages of pregnancy had made it impossible for her to obtain her own food supplies and defend herself against enemies. It, therefore, could not possibly influence her in her choice of a consort, which necessarily had to occur long before that time.

The kinds of economic dependence which have existed since historic times are of a very different nature. While *indirectly* traceable, like every other peculiarly human institution, to man's physical uprightness, "marriage by capture, feudalism and man-made laws" must be assigned as directly responsible for their existence. By taking from woman her natural right of free choice, in matters sexual, and conferring this power exclusively upon man, this sort of economic dependence has brought many evil consequences upon the race, detailed mention of which is inappropriate in an essay of this kind. Yet it cannot be doubted that, for a long time to come, many men and women will continue to join in marriage, mainly prompted by the desire of making a comfortable home and raising a family of children. And to accomplish this creditably, requires the *whole time and energy* of the mother, during the greater portion of her mature life. The earning of the living for the family during this period, naturally and equitably falls upon the father, becomes his special function. And division of labor has its advant-

1. It seems strange that the obvious fact that family relations and monogamic marriage have existed in the human race ever since its advent, should be called in question, seeing that they are found among the anthropoid apes.

ages in this department of life, as well as in others. But, under such circumstances, love and community of interests are the basis of the arrangement, and evil consequences, if any exist, are obviously minimized. The father's knowledge of his economic power must give way to his sense of obligation, and the mother's sense of dependence can hardly be any greater than that existing between equal business partners, under normal arrangements. The force of economic conditions, however, seems to be already tending towards a readjustment of existing sexual relations. For the increasing complexity of socio-economic conditions, and more still the concentration of economic power in the hands of the few; the increasing demands of an ever more complex order of society; the increasing facilities for satisfying the demands of the reproductive instinct in an illegitimate way; the rapid decay of all reliance upon the supposed supernatural sanction for marital unions—all these causes cooperate to produce an ever increasing number of bachelors and spinsters and to lessen the opportunities for attractive marital relations. As the number of unmarried women increases, more and more of them are forced into industrial, self-supporting occupations, and the demand for increased opportunities of this kind will rapidly become more urgent, and is bound to make itself heard. Even animals of comparatively low organization and intelligence resort to nidification during the mating season. But the love of home in the human race is more deeply rooted. It springs from the very structure of man's organism. For this structure made the hiding habit of the females, and the support of mother and offspring by the male, absolute necessities on which the survival of the race depended. And these two habits made a permanent and secure abiding place for the family as unavoidably necessary for the survival of the race, as those habits themselves were.

CHAPTER VIII.

COMPLEMENTARINESS OF SEXES ON LINES NOT RELATED TO REPRODUCTION.

On comparing the males and females of any of the higher mammalian genera, except man, with each other, there is discovered a broad sameness in the structures and functions *not related* to reproduction, and an equal fitness of both sexes for the various activities demanded by the average race life. This fitness is but slightly impaired for the females, during a very brief period, just before and after giving birth to the young.

In the human race, however, physical uprightness has produced a very different state of affairs. By enforcing, during periods of varying length, a separation of the sexes, it has initiated in them a divergence of habits and activities in opposite directions. For, seeking food to support themselves, their females and young, the men could not remain in the security of the places where the former were concealed, but had to come forth into the open to meet the hardships and dangers of the struggle for existence, by fierce self-seeking activities, including the battling with powerful and ferocious competitors and enemies. This demanded agility, audacity, ferocity; the determination to possess and conquer, no matter at what cost of blood, or pains to self or others, and heartless disregard for the sufferings of others, that is to say: *destructive, disruptive, cruel egoism*.

Upon the females in concealment devolved the propagation of the race. To succeed in this they had, firstly: to

guard the secrecy of their places of concealment. A timid, cunning disposition was suited to this. Secondly: to preserve the lives of their young. This required patience, tenderness, sympathy, conservative *constructive self-surrender*.

It is obvious, from the above, that the set of qualities required by the females is the antithesis of that required by the males. One set can exist in an individual, only by the exclusion of the other. The growth, increase, or development of one set in a person, therefore, implies the decrease or decay of the other. Since both sets of sex traits favor the survival of the race, therefore, was their ever greater development fostered by natural selection. In other words, the *ever farther differentiation* of the sexes in opposite directions had a vast survival value.

The complete race life requires both sets, and since, in these latter days, this differentiation is almost universal in mankind, and the partial possession of both sets of qualities by one individual is of very rare occurrence, therefore, must many individuals, of both sexes, be necessarily but imperfectly fitted for the *full* race life, if in this present age they are without the comradeship of a person of the other sex and the consciousness of this imperfection seems unavoidable, though evidenced only by general unrest and dissatisfaction.

This sensitiveness of each sex to its own imperfections is necessarily associated with perception of the proficiency of the other in these wished-for qualities. That is to say, there exists in each sex a sense of its own incompleteness, associated with a belief that the qualities which are lacking can be found in the other.

Therefore, must an individual of one sex, on the average, become attractive to the other, nearly in the same degree as he or she possesses the special sex qualities of his or her own sex. In other words, a man will be attractive to women

proportionate to his manliness, and a woman attractive to men in proportion to her womanliness. In this way has sexual selection aided natural selection to increase and accentuate sex traits in the human race, widening the difference between the sexes.

Now observe that these special sex qualities, although, in the unending chain of cause and effect, the remote results of reproductive activities, were yet, from the very beginning, separate and independent of the instinct, and of the attraction originated by it. Note further, that from generation to generation, under the influence of natural selection and sexual selection, aided by the process which Herbert Spencer calls "Multiplication of Effects," this differentiation of the sexes has reached wider and wider fields of human interest, in the realms of actions, thoughts, and feelings, until in this age there seems to remain hardly a thing, the reactions of which on men, do not more or less differ from its reactions on women, and which is not by the reactions received from man, differently affected than by those which reach it from woman.

To illustrate: Let a manly man and a womanly woman look at the same great work of art, or the same grand scene in nature; they will be attracted by different features of it, and will have aroused within them different thoughts and emotions, different motives for differing actions. Let them read the same poem or other literary production, and the results will differ similarly. Equally so, if both have the same problems in politics, economics, religion, ethics, business, or daily conduct presented for decision.

And in every such case the angle of divergence between the persons of different sex will be the same as that indicated by that first separation of the sexes, when the male confined himself to the struggle for existence, and the female to the propagation of the race. Mark now the truism: that

the range of activities of the human body and mind, and the joys of doing, thinking, feeling, are deepened, *pari passu*, with increase in the perceptions of more details in the phenomena that affect us, and with multiplication of the subjective activities they provoke.

Since, by reason of the differentiation here under consideration the female perceives, in nearly all phenomena presented, some details which the male does not, and, therefore, acts, thinks, feels, in some respects as the male does not, and vice versa, therefore, can each by itself act, think, feel, only incompletely with reference to the wonderful variety of things in this universe, which are more, if not doubly more, completely available to the dual human molecule—man and woman united in close, intimate comradeship. So that the single life can never be commensurate with the magnificent and beautiful possibilities of human action, thought, and feeling; can never rise to the full dignity of the human destiny; but must unavoidably fall short of it.

The complete life, the highest of which we are capable in usefulness, in beauty and in joy, can only be reached in the joint life, close intimacy, and comradeship of two of opposite sex.

CHAPTER IX.

CONCERNING THE ORIGIN OF WARFARE AND THE DIVISION OF
MANKIND INTO CLASSES AND MASSES.

Individual character may be defined as the principles from which the uniformities in a creature's conduct or actions arise. These principles are determined by the intrinsic nature of the creature, but the actions derive their specific quality from the functional adaptation of the external organs. And the external organs *are visible*. Therefore, can the character of an animal be ordinarily known by its external appearance.¹

1. Mimicry in nature, which misleads animals by external appearances with reference to the character of creatures, depends for its survival value on the validity of this rule. To illustrate: A certain harmless fly escapes from enemies by looking in color and form like a dangerous, stinging wasp, and another by looking like a leaf, etc.

The character of the fly remains harmless, after variation has changed it in appearance to a stinging wasp. If, afterwards, the enemies of this fly disappear, because afraid to feed on this dangerous looking wasp-like thing, then the wasp-like appearance of this kind of fly tends also to disappear, in the course of a few generations, by a process, which may be explained as follows: When most of the flies of this species were being born looking harmless, then there appeared here and there by variation an isolated specimen, looking like a wasp. The harmless looking kind would be eaten by enemies before reaching the reproductive age, but the wasp-like would escape and reproduce. In the next generation, therefore, the number of the harmless looking would be diminished; that of the wasp-like increased. In the course of a few generations the harmless looking kind would be so scarce as to seriously affect the food supply of their enemies, which would either have to depart from that locality or die from starvation. In either case, the harmless looking variety would begin to increase in numbers, from generation to generation, until their enemies would

For example: The long, sharp claws, great protruding jaws, long dirk-like incisors of the lion, his powerful muscles and frame, the shaggy mane protecting his front—these appearances indicate what kind of conduct may be expected from such a creature. The long, slender legs, graceful body, and large eyes, do the same for the character of the deer. The long and mobile ears, low body, muscular haunches, show the character of the rabbit or hare; and so on, almost through the whole range of animal life.

It could not be otherwise, for if those outward organs, on which creatures depend for their reactions with the external world, did not correspond with their character, on which the *nature of these reactions* depends, then such animals could not adapt themselves to their environment long enough to live to maturity. Such types would die out in remarkably short time.

To apply this rule safely to man requires great care in distinguishing between his artificial and natural appearance. For civilized people have become so thoroughly used to the extreme artificialities of the conventional kinds of toilets and dress² that they are involuntarily more impressed

be attracted by the ample food supply and the reverse of the process would begin, and so on.

It is note-worthy that when one type begins to diminish, it becomes harder for both sexes of that kind to find mates of their own variety and that this difficulty increases the rapidity with which the other type tends to predominate.

Would careful consideration of the process above described not justify distinguishing the harmless looking flies as "the ordinary hereditary," or "true" race type? And the wasp-like, as the exceptional "false" type, which owes its existence to natural selection when the race is crowded by its enemies and will tend to disappear whenever these enemies of the race are overcome? This law of nature should be kept in mind by the reader, for, although, the conditions in the human race are far more complex, yet the law applies.

2. The word "toilet" is used here to signify artificial changes in the appearance of hair, head, face, etc., to distinguish these from dress, which appertains to coverings for the body.

by alternations or deficiencies in these than by slight physiological variations. Just think how the absence of a necktie from a gentleman's attire, or of shoes and stockings from a lady's feet, would startle the average conventional person!

The bodies of civilized persons are usually concealed by artificial coverings, and the head and face are transformed by the toilet and the labors of the barber and hair dresser. However, these trifles contributed by tailor, barber and their like, can not indicate the manly characteristics in the nature of a person—rather would punctilious care bestowed on them be significant of absence of these.

Artificiality in externals is not confined, however, to contemporaneous civilized people. It has been practiced ever since history began by nearly all those who could afford it, and even savages and barbarians disfigure the natural beauty and dignity of the human body by various familiar devices.

Greek statuary and the comparatively naked bodies of the natives of Africa, and of the coolies of India, come nearest to showing the natural appearance of man.

And what sort of race character does this imply? viz., the utter absence of means of offence, defence, protection and escape; the exceptional vulnerability; the liability to numerous injuries and perils, from which all other creatures are free; the exceptionally high elevation and mobility of the head, where the senses of sight, hearing, smell and taste are located; the complexity of the organism suggesting a wide range of possible compound, concerted motions, and the elevation above ground of the hands implying a refined sense of touch?

To brutes this appearance would suggest extreme inoffensiveness. To the mind of man, if not prepossessed, it indicates extreme adaptability, fitness for wide and varied

observations, with exceptionally high qualifications for intellectually comparing, compounding and enjoying this great variety of experiences, this beauty and grandeur in the world, and for applying these experiences to ever fuller understanding and to finer adaptations of conduct to environment.

Peaceful disposition; docility; the bodily capacity to do many different things; the intellectual ability to apprehend great possibilities, and to entertain great far-off purposes during lengthy periods and to direct efforts in the line of their attainment—such are the characteristics implied by the visible appearance of the natural human body.

A combination wonderfully well adapted to the highest forms of productive, not to say creative, cooperation: add to these the habit of individual industry which is comparable to atomic forces, the effect of which, though insignificant when exercised by one atom alone, becomes irresistible when a common impulse causes great numbers to co-operate; and we have a potential agency by which the eternal, infinite, relentless forces of the universe and the resources of nature may be brought into the service of sentient life; and this earth, transformed from being a place of hopeless toil and misery for millions, into a real home for the entire human race, to the maintenance of which in peace, plenty and happiness for all, each could contribute his best voluntary efforts, and in return receive an equitable share in the general wealth produced by all.

This is the sublime destiny humanity can attain. How is it that it has so sadly fallen short of it?

For this there are several reasons, the first being that, as explained in Chapter VII only among the females could the character above delineated survive during the long ages before men had learned to arm themselves artificially, while they were still crowded by their powerful brute enemies and

competitors. During this period natural selection eliminated from among the males those which arose from generation to generation endowed with these beneficent characteristics, and only the fiercely combative, imbued with destructive egoism, survived. Among these, however, in accordance with well-known tendencies of sexual reproduction, a small number must have sporadically appeared, endowed with a combination of the characters of both sexes. This was the heroic type of man.³

Possessed of immense muscular power, great agility, indomitable courage, fierce combativeness, great cunning, reckless disregard of wounds and of the danger of meeting death, and equal indifference for the blandishments of glory or reward: endowed with deep and sensitive sympathy for the feeble and helpless of his own race—this type was preeminently fitted for the severest tests of bravery, skill and endurance. Such heroism, however, was evidently only available for defensive warfare against the brute enemies of mankind. Aggressive warfare directed against the feeble and defenseless of our own race, instigated by greed or lust of power or riches, was obviously impossible with such men. Such characters would prove a help, and could never be a hindrance, to the attainment of humanity's sublime destiny. But there were others, possessing the same fierce combativeness, without the safeguards supplied by sympathy.

When these two types of men began to arm themselves

3. The reader must be warned against the error of inferring from the above, that the personnel of humanity as it exists today, or as it has existed in the past, is divisible into two sharply contrasted types, one exclusively displaying the true race character and the other the robber type.

Occasionally individuals occur, exclusively displaying the traits of either one or the other of these types, but the great majority combine some of the traits of both types in their personalities, and of these it can only be said, that the traits of either the one or the other type predominate in their characters.

artificially with sticks and stones, what a wonderful transformation this brought about! What a contrast between the helpless, miserable two-footed upright brute and the hero armed with club and stones! Such a type of men, supplied with these artificial weapons, for which their organism had such wonderful natural adaptation, was easily a match for the fiercest and most powerful among their brute enemies and competitors.⁴

With the acquisition of ever better skill in the use of clubs and missiles, and with improvements made from time to time in their form and quality, there came an end to the perils and disabilities which had kept the race close to the verge of extermination. Security had come at last, and with it increase in numbers. Matriarchal and Patriarchal groups were in process of formation. Natural selection, in so far as it arises from struggles with brute enemies and competitors—and that is the whole of it in the ordinary acceptance of the phrase—no longer eliminated the patient, the gentle, nor those fitted for constructive self-surrender among the men. Some of this latter class probably began about this time to engage in industry, by the shaping of crude tools, arrows, stone axes, etc.

The domestication of animals, the beginnings of efforts at the cultivation of the soil and of the accumulation of small stores of fruits, nuts, and other necessities of existence beyond immediate wants, are usually placed by anthropologists in these periods. The decisive battles with brute enemies had been fought and won. That chapter in the history

4. It seems likely that the myths and traditions of the heroic age, of which more or less voluminous traces are found in the earliest records of every nation, have more truth in them than is generally believed, and that they have been derived from the tales, transmitted from generation to generation, of memorable deeds of valor really performed by the most brave, cunning, and physically largest and strongest among our earliest stick and stone using ancestors.

of the race was closed. Man was supreme master on earth. Henceforth, if anything, except some great convulsion of nature, was to threaten the existence or hinder the progress of the race in the direction of its sublime destiny, then it could not come from without, but had to arise within the race.

The fearful devastations produced by man's life-destroying ability and ingenuity were briefly illustrated in an earlier chapter. When, by the activity of these traits, the complete subjugation of man's brute enemies and competitors had been accomplished, then the opportunities for the exercise of these traits had also been thereby greatly reduced. These faculties, however, remained potentially in full force, and in accordance with a well established psychological law, they *craved* action *all the more* because of the recent strenuous activity.

The great lesson of science and morality had not yet been learned, that the energy and ingenuity formerly dissipated in these destructive actions, if devoted to voluntary co-operation in productive industry and exchange, would accomplish stupendous improvements in the happiness of the persons thus engaged, and in the general progress of all humanity towards its sublime destiny. Nor is this self-evident truth even today appreciated by more than a small minority of persons.

It follows then, that only opportunity or temptation were lacking to turn these fearful agencies of suffering and destruction against the feeble and defenseless in the human race.

Both the opportunity and the temptation came quickly enough. For action is always in the line of least resistance or greatest attraction. It has been mentioned in an earlier paragraph of this chapter, that about this time some of the "hominidæ" began to gather small accumulations of the

necessaries of existence, in or near their family retreats, for future use. These little supplies furnished temptation and opportunity. Nothing is more attractive or tempting to animals than ready-made supplies of the necessities of existence, or objects of desire. The *possible* supplies, out of sight, and hard to find, and to be gathered only as the result of laborious, persistent, risky efforts, can not be nearly as attractive or tempting to them as ready-made accumulations within sight. Here, then, was opportunity, temptation, and the line of greatest attraction.

It was not in the least difficult or dangerous for artificially armed, fiercely combative men to overcome the resistance of the helpless females and young, who were sometimes, and in some places, left, during all the day, as sole defenders of these accumulations. So this was also the line of least resistance.

At first such attacks were probably few and rare. For the very fact of the existence of small accumulations relieved some of the men from the necessity of going daily in search of food, and by the premises in this argument, man's powerful brute enemies were sufficiently subdued at that period, so that there was no need of going daily in pursuit of them.

The males inclined to these depredations, however, would not venture on them on days when the other men were with their families. Only isolated cases would occur, when roving males, finding that the protecting men had gone away from retreats in which accumulations existed, would dare to make raids on them. This was the line of greatest temptation, attraction and least resistance. They would make attempts to enter the retreats to possess themselves of the supplies. The females and young would make determined but inefficient resistance, and would be easily overcome in a contest with strength and ferocity, during the progress of

which some of them may have been killed and others wounded.

It must be left to the imagination of the reader, what, if any, scenes of terror and rapine followed the success of such raids, during the long day, before the men, the rightful owners of these supplies, returned to their plundered retreats, and whether the ingenuity of these predatory males had made sufficient progress, in that early period, to support the supposition that the more determined of the resisting females and young were bound and gagged with long strands furnished by trailing or creeping plants, or with stringy materials derived from the bodies of animals that had been killed.

The probability is that, late in the day, possibly after dark, and loaded with the spoils of the hunt, the men belonging to the plundered habitations would return, and that then, provided the robber males had remained there, the real battle began.

To sum up the argument: For many hundred generations, a cruelly combative character had been naturally selected among men. For several generations at least there had been, in the work of subjugating man's powerful brute enemies, active occupation for this disposition. This very activity, however, had gradually minimized the opportunities for its exercise in that line, and thus produced and enforced an inactivity of these faculties and powers, formerly so active. Such a condition was decidedly irksome and hard to bear for the combative type of men.

Then, with all the force implied by least resistance and greatest attraction, came the opportunity and temptation for exercising these traits within the race. Is this not ample and sufficient proof that they were used in this way? Namely: that many of the artificially armed men, about this time, began to make attacks on the accumulated stores deposited

within the retreats of the helpless females and young, with the result stated above.

It is admitted here that some unimportant portions of the last arguments were unavoidably of a speculative nature, and that nothing more than greatest probability and conformity to the rule of parsimony can be affirmed in supporting them. This, however, is sufficient to throw the burthen of proof on those who deny their truth. Since this line of thought is full of valuable suggestions and extremely interesting, it seems permissible, in this closing chapter, to pursue it a little further.

Deeds of justice, altruism, or beneficence, naturally attract but little attention. They are done under the influence of those complex mental states which are found only among the morally developed. They seek seclusion, not notoriety nor distinction. These latter are the desire of low, selfish, vain natures. Justice and beneficence choose privacy for their activity. Their purpose is for others, whose feelings would be wounded by display. Only false pretenders to deeds of justice or beneficence choose publicity or display. Besides, display diverts and distracts from the concentration of purpose and delicacy of touch involved in deeds of gentleness, justice, beneficence. Furthermore, since sympathy depends on similarity of nature, only the just, beneficent, and altruistic by nature can be influenced by perceiving deeds of this kind. And since motion is always in the line of least resistance or greatest attraction, therefore, do deeds of this kind attract but little attention, and lead still less to imitation or repetition by others.

But it is otherwise with selfish, sordid, cruel acts. Their example, like fire in the dry herbage of a prairie, when the wind blows, spreads with fearful velocity and force. For every creature has selfishness as a primary instinct. There-

fore, if a cruel, selfish, unjust act is but successful, then the evil example appeals to the lowest nature of every one. Here is the successful attainment of some object of greed or passion, by the easiest and most direct means, and this attracts every low nature, and whatsoever there is low even in a high nature. This is the line of greatest attraction and least resistance.

Therefore, it can safely be taken for granted that the example and success of the first few of these robber raids, above mentioned, led to the rapid extension and multiplication of such enterprises, until they became well nigh universal and continuous within the area inhabited by man. Even some of the men whose retreats had been plundered, being deprived of home and loved ones, might, in the bitterness and despair of their feelings, drift into following a predatory life.

When introracial warfare had thus become general, all human beings, except the predatory men themselves, suffered from the prevailing state of insecurity. Only the few matriarchal and patriarchal groups, which existed in that period, may have been able to offer successful resistance to these raids. But as has been shown in earlier chapters the far larger number of human beings of that time lived in isolated families. The females and young of these, if they escaped slaughter and captivity, were driven from their retreats and dispersed.

Terror-struck and running away from their enemies, without knowing whither, crowds of these fugitives coming from many different directions would tend to meet at the crossing points of their various lines of flight. And at these they may sometimes have been reenforced by some of their own men searching for them, or retreating from their despoiled homes. The coming together of large numbers of fugitives

who all suffered the same kind of injuries from the same enemies would naturally move them to make common cause, and large numbers would give them a sense of power, and move them to united action against their enemies. In this way the origin of promiscuous groups and hordes is accounted for, and these may afterwards have developed into clans and tribes. To be effective, all these aggregates required leaders, and the fiercest, most energetic and cunning would naturally become head men. The internal peace of the human race had been broken. After that it consisted of hostile groups. Each group hated every other. Anthropologists teach that to belong to another group was punished with death on sight, and that tribe marks were cut or pricked into the skin of the forehead, or some other prominent part of the body, so that fellow tribesmen might know each other as such and not engage in mortal combat, when they met by accident.

The stronger and more energetic of the groups made war upon the weaker, to rob, subjugate, or destroy them. Nor was there peace between the members of a group. They were divided into factions by jealousy, ambition, and greed. Fear of external enemies and of their own leaders was all that held these groups together. Comparative security from outside enemies they secured, but at the expense of the most precious of man's possessions, viz., personal liberty. Co-operation was no longer voluntary, nor for mutually beneficent aims. Thereafter it was forced, and devoted to warfare. Fear of external enemies, dread of the leaders, and desire for their favor and protection, led by easy steps to the subjugation of the many to the will of the few. Thereafter there were rulers and ruled. The ruled, if but permitted to retain their lives, would willingly give service and obedience to the rulers.

Henceforth tribal and clan existence had survival value, in proportion to the progress made by the many towards implicit submission to the will of the leaders and their usual ring of favorites. Large tribes and clans with able headmen might enjoy a degree of comparative internal security. During such times productive industry and division of labor had a chance to begin.

But from that time until this day the robber-type have retained control of political, economic and conventional affairs and humanity has never succeeded in ridding itself of the division into the ruling, exploiting, luxuriously living, non-producing classes and the ruled, exploited, poorly living, producing masses.

To account properly for this fact, the argument would have to be carried so very far beyond the limits of the epoch here discussed, that a merely general mention of some of the more important factors in the problem must suffice.

Productive activities and progressiveness in economic methods require *the true* human race characteristics (see note 1 to this chapter), viz., sympathetic amiability, docility, industry, intellectual capacity, inventive ingenuity. To rule others, demands the robber-type of *false* race character, viz., self-seeking, unsympathetic, remorseless egoism.

Warfare since time immemorial has been nearly ubiquitous and perennial within the territory populated by man. The comparatively few and brief intermissions of peace, have usually been confined to periods during which aggressive communities were slowly recovering from the exhaustion produced by previous conquests, or during which conquered people were gathering strength to struggle for freedom.

The "*artificial state of society*," which has existed for many ages and still prevails, has been gradually but persist-

ently built up during thousands of years, along lines favorable to the supremacy of the classes and their maintenance by the sacrifice of the masses.

The consolidations of clans and tribes into nations and of nations into empires has been accomplished by wholesale assassinations, through armies, navies, etc.

Political repression of the masses of advanced nations has been carried on by legislation and judicial administration in the interest of the classes.

By unequal and indirect taxation, by tariffs, private monopolies of vital necessities and natural resources, etc., economic pressure has been brought to bear on the masses.

Pulpit, platform, press, school, conventional regulations, etc., have been some of the instruments by which the ruling classes have molded opinions, beliefs and moral standards into conformity with their interests.

The ingenuity, which, among producers has led to inventions, discoveries, progress in art, science, mechanics, etc., in the ruling classes has tended to ultra-refined modes of deception, treachery, cruelty, etc.

Greed, hypocrisy, self-indulgence have been cultivated into great efficiency.

Special codes of ethics to guide the conduct of rulers towards the ruled, have been ingeniously elaborated to justify the practice of fiendish tortures, basest treachery, etc., including among others, similarly atrocious, maxims like these:

"That when the people become restive under oppression and the authority of the rulers seems in jeopardy, they may make promises and the most sacred pledges to the people, with the deliberate purpose of breaking them as soon as the danger is past."

"That it is virtuous and honorable to deceive rebels by any means, no matter how heinous."

That "no considerations of humanity or pity are applicable to rebels."

And rebels are "people who resent or resist the rule of the rulers."

Whether this resentment or resistance has arisen from the unbearable despotism and wickedness of the rulers, or from the outraged higher sense of justice, duty or honor of the rebellious persons makes no difference in the operation of these maxims.

By these means and others, it has been brought about, that the utilization of the forces and resources of nature, made possible by the ever greater and swifter progress of human genius and industry, has up to date, served almost exclusively to increase the wealth and power of the ruling few and the helplessness and misery of the many. Thus mankind remains divided into classes and masses.

And the masses by hundreds of generations of subjection have acquired a habit of submitting without murmur or resistance. They have been falsely taught that this is the law of nature and religion, that: "The poor ye have always with you"—that it is right for them and their religious and moral duty to submit cheerfully. And popular judgment, therefore, condemns those who in righteous indignation object, protest or resist.

For this reason the occasions are now rare when the ruling classes resort to wholesale slaughter to impress the masses, with the wisdom of submission and the futility of resistance.

But when, as in Russia, centuries of atrocity, have driven millions of the masses into courting death in an almost hopeless struggle, rather than live under the established rule;—or when diamond fields and gold mines have excited the extreme cupidity of the robber-type, as in South Africa, and if the

resources of hypocrisy and betrayal, in the subtilty of which the classes so greatly excel the masses, fail to secure submission, then the wholesale slaughter of the innocents begins. And even historians and poets are found, which are not above degrading their noble callings, by paeans of glorification, to the hireling, false pretense heroes, engaged in such inglorious assassinations.

It is not intended by the above to imply that the robber-type of men is confined to the ruling classes. Having been naturally selected during many generations, by its own evil influence on social, political and economic environment, it is but too much in evidence among the masses.

Nor should the last paragraph but one be interpreted as singling out the English people, nor even the British government, for condemnation. For the English people has frequently been the champion of liberty. Nor can it be justly asserted that the British government, even when in the hands of Tories or Conservatives, is more brutally aggressive against weaker people, taking opportunities into consideration, than the other great powers are. The example of the Boer War was selected as an illustration, because it is fresher than other such incidents in the memory of contemporaries.

If any adequately informed readers doubt whether the phrase "*artificial state of society*" used in the twentieth paragraph above, correctly designates the system under which humanity exists in this age, then it is only necessary to remind them, that healthy organization, natural order, like growth, proceeds from the attractions existing within that which grows, that which is being organized, that which is attaining a higher form of order; it *never results from external pressure*. Mere increase of mass, with or without closer contact, when produced by external pressure, can never lead to healthy growth, to natural order; it *remains always artificial*,

forced. This applies, *a fortiori*, to organic matter, and supremely to human beings. Our present order of society, being the result of force and being held together by force, is, therefore, artificial.

Only when the inhabitants of the earth shall be habitually under moral self-control, but free from human coercive interference; when a long reign of justice shall have produced an era of implicit confidence; when sympathy shall have led to national and international application of the principle of voluntary co-operation in matters of production, distribution and administration—only then shall we have a natural order of society, and an approach toward our sublime destiny.

Although these conclusions and those reached in earlier chapters, obviously have deep and vital bearings on the problems in ethics and public policy, which in our present age are so urgently pressing for solution, yet ought these relations not to be considered in this place, because they appertain to departements of knowledge and periods in time clearly outside the field here discussed.

The true nature of some of the evils from which society suffers and their cause has been traced. It remains for human genius and heroism to find the remedies and bring them into action.

APPENDIX NOTE I.

ON MEMORY.

We become aware of memory when fainter repetitions of former experiences arise in the mind, seemingly disconnected from the causes which primarily produced them. For instance, suppose the sounds of a church bell are heard ringing on a summer evening, in a meadow surrounded by hills. The sensations of sounds heard, of sights seen, of soft breezes fanning the cheeks, of fragrance in the nostrils, are directly connected with the causes which then and there produce them. After some days suppose a witness of this scene wishes to describe it to an evening party of friends. Faintly, the sensations arise again in his mind, seemingly disconnected from the causes which originally produced them some days before. No church bells are ringing, yet faintly in his mind he is aware of their sound. No landscape of meadow and hills glowing in the sunset greets his eyes in the artificially lighted room where he is speaking, but within his mind arises again a faint likeness of the scene he wishes to describe. No flowers are in the room, yet as he describes, he seems to experience a faint semblance of their fragrance, and a feeling of well being and content, similar to that felt, on the evening when he witnessed the scene, again comes over him. This we call memory—our recollection, or remembrance of those experiences.

Whence and how, apparently disconnected from the causes which produced the primary impressions, do these manifestations *arise again* in the mind? To find an answer

to this question, consideration must first be given to the problem, how the real causes produced the primary impressions.

The sound waves from the vibrations of the bells affected the auditory nerves. The vibrations of light transferred by meadow, hills, sky, landscape to the invisible ether were by this transmitted to the nerves of sight. The infinitesimally small particles of odorous matter exhaled by flowers, etc., into the atmosphere, affected the olfactory nerves. The motions of the breeze reacted upon the nerves of touch located under the skin of the face, neck and hands, and all these reactions affecting the nervous system as a whole, caused the general feeling of well being and content. It is obvious then, that all the original experiences were produced by external causes acting on nerves.

But this does not explain how the subsequent fainter repetitions arose in the mind of the speaker, after the external causes had for many days ceased to act on his nerves. This mystery can not be explained except by one hypothesis: that when the external causes were producing the original experiences, they simultaneously effected *alterations* of a more or less *permanent* nature in the organism of the witness, and that, so long as these alterations remain, whenever a current of nerve force moves through these altered parts, then it is modified *by the existence of these alterations* in such ways as to reproduce in consciousness a more or less vivid repetition of the original experiences.

An analogy may prove helpful. Suppose two people conduct a conversation in presence of a phonograph. This instrument has a cylinder with a covering sensitive to sound waves. By some mechanism the cylinder is made to revolve while the conversation is in progress, so as to present, from moment to moment, a succession of different parts of its

surface to the sound waves. The sound waves produce *permanent* marks on the surface of the cylinder, and when *thereafter* it is made to revolve, these marks cause sound waves to arise, which reproduce the words and the peculiarities of the voices, as they were in the original conversation, only somewhat fainter and modified by the imperfections of the instrument. The repetitions of the conversation by the instrument would be *impossible unless the sound waves from the original conversation had left permanent alterations (markings) on the cylinder*. If the marked cylinder is taken out of the machine, and one which has not yet been used is substituted, would it not be preposterous as well as impossible, to imagine that any sound of the conversation before mentioned could become audible thereby, even though the cylinder was revolved for ever and ever?

Leaving analogy and applying the same line of reasoning to our problem, it follows that memory depends on the structural permanence of the nerve cells. If nerve cells died when exhausted by functional activity, like the other cells, and were then replaced by new cells, memory would be *inconceivable, if not impossible*, for the new cells could not any more produce the old experiences than the new cylinder of the phonograph could repeat the conversations which had made markings on the other.

Two other hypotheses to account for memory have been current. The first differs from the one above detailed, in that it supposes the alterations or markings to occur in the tissues surrounding the nerve cells. This can hardly be maintained in the absence of evidence to sustain it.

For it is an obvious fact that the external causes act *directly* on the nerves. If they act at all on the tissues surrounding them, (and this is so far not known,) they can

only do it indirectly. This can, therefore, not claim to be more than a mere guess.

The other may be described as follows: From each *kind* of external causes the impulses are transmitted to special nerves located in special parts of the body, and these nerves are specialized to receive impressions of that kind only. *By this hypothesis*, do these impulses produce no permanent alterations or markings on these nerve cells. But because these cells are specialized to this class of phenomena only, therefore, whenever a current of energy passes through them then the sensations which distinguish that special kind of external cause are revived, and this is supposed to account for memory.

If this is true, if the external causes do not alter or mark the nerves which are specialized to their service according to this conjecture, then why could not these nerves cause the experiences, which distinguish the external causes to which they are devoted, *before* they have been acted on by them? By the hypothesis they are the same before as after. What need then for experience, education, study? Let a current of force flow at birth through the infant's nerve cells and ~~he or she~~ will at once possess all the wisdom and general ability that a lifetime could possibly give. What strange, absurd hypotheses may pass current while they remain unchallenged!

APPENDIX NOTE II.

ON ALTRUISM.

The support of brute-woman by brute-man, which was discussed in Chapters V and VI, seems to constitute the first instance of *conscious human altruism*.

The love of the mother for her child has frequently been upheld as the original and highest form of altruism in nature. But is it? Altruism has been defined as "devotion to others." Surely the mother is devoted to her child, and the child being another, this is a true form of altruism. But with reference to time, is it the first? Evidently not. For in sexually reproducing creatures before a mother can have a child, the child must have a father. As shown in Chapters V and VI, the human father made efforts to provide for the mother, before the child was in existence, and the mother, with reference to the father being *another*, this constitutes a form of Altruism, antedating the mother's devotion to her child.

So far as it is possible to know, this must have been the first form of *conscious human altruism*. Which of the two is the higher form? By which criterion can conscious altruism be graded as higher or lower? Obviously by motive! What is the motive of the mother's devotion to her child? Can it be called motive at all? May it not be described as purely instinctive? Up to the time of birth, the child is within the mother's body. Her devotion to it during that period can hardly be distinguished from self-devotion. Then, when the child's internality changes to externality, the devotion to it is a continuation of the former feelings,

therefore, hard to distinguish from instinct. It must necessarily grade very low by the criterion of motive. How was it with the devotion of brute-man when he provided for the necessities of his female mate? It cannot be denied that originally male and female were attracted to each other by reproductive instinct. But, as has been illustrated in the foregoing chapters, there grew up, during the long months of comradeship, from intimate acquaintance, laboring, rejoicing and suffering together, a fellow feeling, unavoidable under such conditions, between natures susceptible to it, and closely akin. The high development of this trait in later times, is evidence that the susceptibility to it existed from the first. Then when he brought food to the woman in concealment, who can say that fellow feeling *was not the most powerful* among the complex motives of the man-brute?

If it be asserted that the desire to indulge the reproductive instinct was the sole motive, the answer is, that this *could not be so* because, at that period, females will not submit to it. Man's ancestors, during the era here referred to, were nothing more than intelligent brutes, and no female brute will permit the male to indulge at such a time; (last stages of pregnancy). This is a rule, almost without exception among wild brutes. That it is different with some men now living in civilized communities, is no reason for believing that anything like it occurred with brute-man. Indeed this which now sometimes does take place between men and women is obviously the result of civilization. For during many generations civilized women have abjectly depended on the men who supported them for a mere chance to live. Many such men have sexually selected their consorts with sole reference to abject submission in this matter of intercourse. How could the well attested greater rarity of this kind of abuse among savage people be otherwise accounted for?

It appears, then, that fellow feeling and sympathy were present, if not predominant, among the complex motives which induced the devotion which the human male-brute displayed, when he provided for the needs of his female consort in concealment. This constitutes a true case of conscious altruism and ranks higher, by the criterion of motive, than the mother's devotion to her child. As to priority in time, and superiority in motive, does the devotion of the lover to his bride outrank the mother's love for her child?

This conclusion, however, would not justify an inference that the complex, refined, and evolved altruism of the women of today is inferior to the average altruism of men of the present age, but it would support the opinion that in its original undifferentiated form the altruism of the human male-brute would be more readily transformable into the intellectually initiated higher forms of this tendency, such as: devotion to high principle, to justice, to truth, to classes, foreign nations, humanity, to life, in general to

“ That thread of the all-sustaining beauty,
Which runs through all and does all unite, ”

and it seems that the consensus of historic and contemporary experience supports this view.



APPENDIX NOTE III.

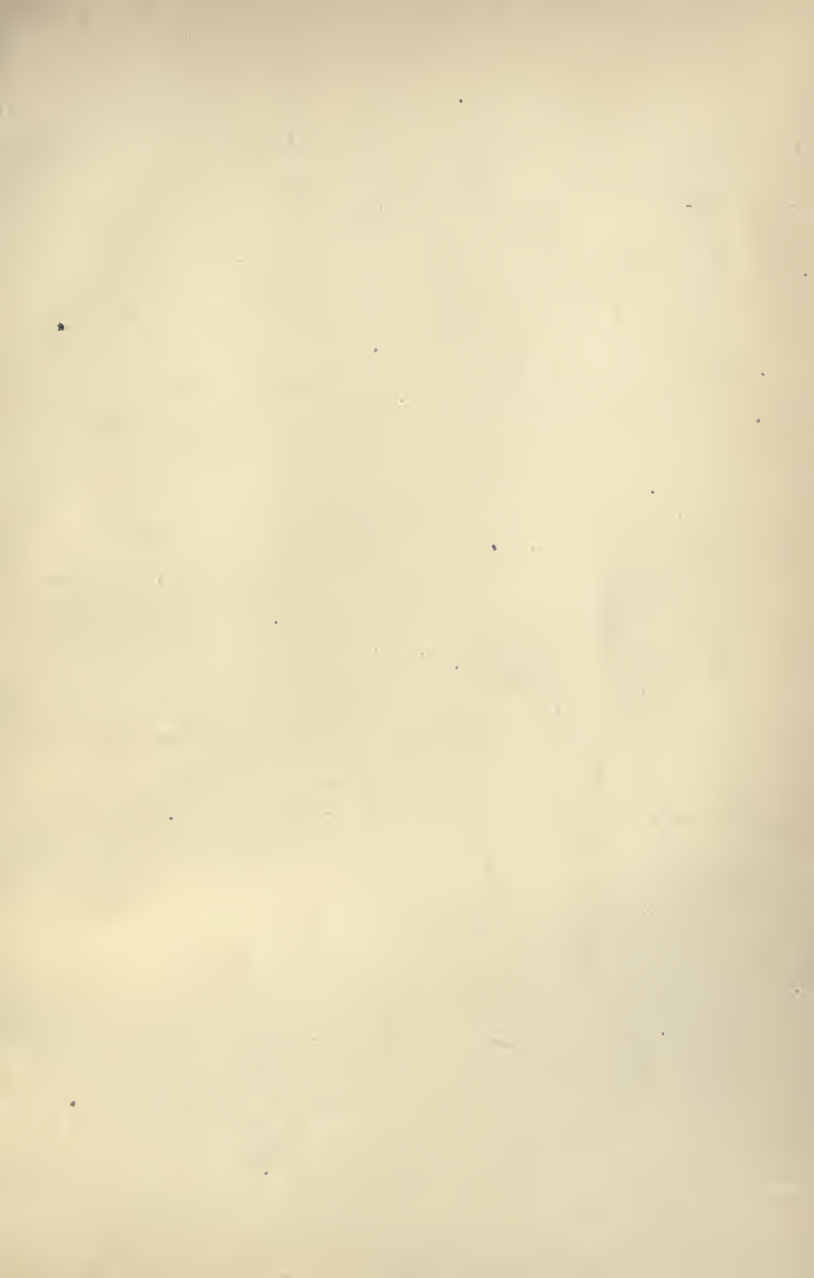
Variation and Fluctuation in Higher Animals.

In sexual reproduction, the matter and force required to begin the growth of a new organism are derived from two parents. By the conjugation of the part coming from one with that from the other, a mixture is obtained competent to cause a new life to grow.

If both parents are of the same species then fertile offspring are the result. Creatures of the same species must resemble each other in those congenital specific traits by which their species is distinguished, but in other congenital traits they can differ, and the probability is infinitely great that they will so differ. The reproductive matter and force from an organism which differs congenitally from another, must differ from the reproductive matter and force coming from that other. Two substances different from each other, when mixed, produce a mixture which differs from both. Sexual offspring being the result of such a mixture, therefore the probability is infinitely great that *no such offspring* can be exactly like either of its parents. And inductive experience confirms the conclusion thus deductively reached. Each generation slightly varies from the parental type. This is "variation"—a result of heredity.

Fluctuation is a term lately come into use, to signify non-congenital differences, which are "acquired" during the life time of an individual, through the influence of the environment.





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